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TUBERCULOSIS.

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OF

TUBERCULOSIS

Vol. XV.

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ORIGINAL ARTICLES.

MONTANA AS A HEALTH STATION FOR BRITISH TUBERCULOUS SUBJECTS.

By T. N. KELYNACK,

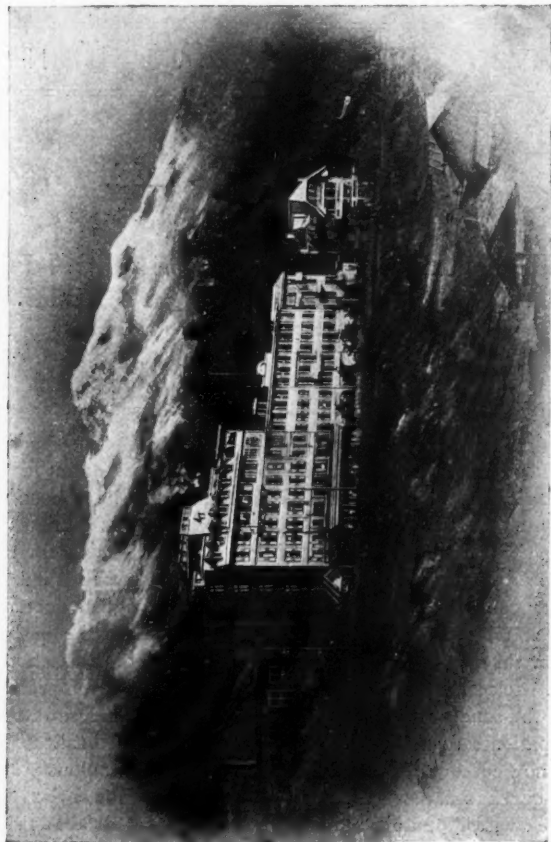
M.D.,

Physician to Mount Vernon Hospital for Tuberculosis and the Children's
Sanatorium of the National Children's Home and Orphanage.

TUBERCULOSIS is a disease in the production and arrest of which climatic factors count for much. Numerous works have been written regarding the advantages and disadvantages of various climates in the treatment of consumption and other forms of tuberculosis. Switzerland has long been designated the Playground of Europe, and it is certainly a country peculiarly rich in health stations. English doctors have taken an active part in the development of some of the best-known centres for tuberculous cases, and large numbers of English patients have won back health in the High Alps.¹ The past seven years of war and post-war conditions have made it impossible or undesirable to send English patients to this wonderland of health and healing, but the time has now come when many tuberculous and tuberculously disposed cases are eager to undergo a course of treatment in the Swiss Uplands and at the Swiss Mountain Sanatoria; and many medical advisers also are desirous of obtaining reliable information regarding conditions existing in such health centres as are now open for British patients. I

¹ Much useful information likely to be of service to medical advisers will be found in the late Dr. Burney Yeo's well-known work on "Climate and Health Resorts," the late Dr. W. R. Huggard's "Therapeutics of Climate," and his article on "The Influence of High Altitudes," in the *Practitioner*, July, 1908. See also Dr. Bernard Hudson's article on "Alpine Health Resorts for Tuberculous Subjects" in the *British Journal of Tuberculosis*, October, 1919, vol. xiii., No. 4, p. 174.

have recently visited Switzerland with a view to ascertain from doctors and patients in that country facts as to ways and means, and to gather opinions as to the desirability of sending patients for a prolonged course of treatment. Among health stations to which British tuberculous cases can be sent, undoubtedly Montana occupies the first place. It is



MONTANA : THE PALACE HOTEL ENGLISH SANATORIUM.

the object of this article to draw attention to some of the chief features which make Montana a particularly desirable resort for Englishmen and Englishwomen predisposed to tuberculosis, or in the early and less advanced stages of tuberculosis of the lungs, glands, bones, joints, and other parts of the body.

Firstly, it must be stated that Montana can now be reached quickly

and without discomfort.¹ Montana is situated in the upper Valais, over 5,000 feet above sea-level and 3,000 feet above the Rhone Valley, on a

¹ Patients going to Montana from London can travel in great comfort via Paris and the Simplon Orient Express to Sion, and then change into the next train, which stops at Sierre. Another excellent route is to go from Calais to Bâle and Berne, and thence by the wonderful Loetschberg route to Brigue, at the entrance to



MONTANA : GENERAL VIEW OF THE MOUNTAIN RANGE OPPOSITE THE
MONTANA PLATEAU.

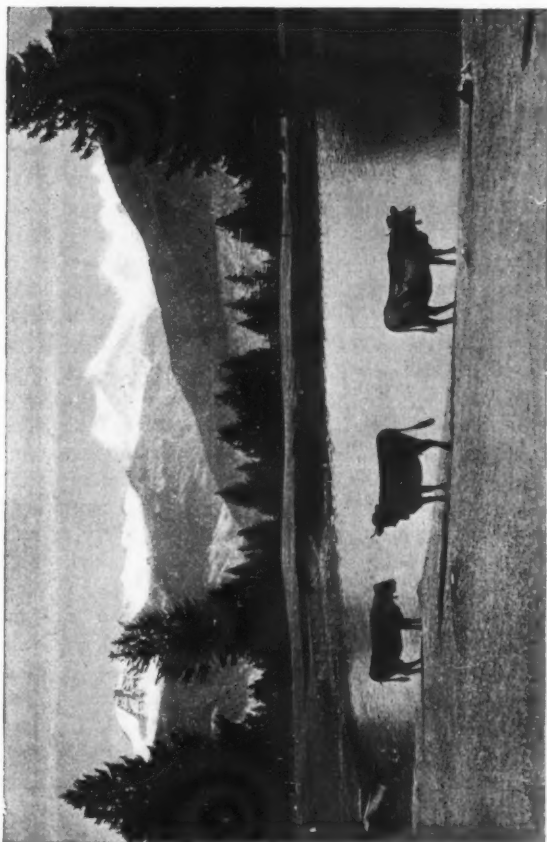
the Simplon tunnel; a change is made at Brigue, and a short journey down the Rhone Valley brings the patient to Sierre. There is a funicular railway from Sierre to Montana. Arrangements should always be made well in advance for seats, or, if necessary, places in sleeping-cars, to be reserved for patients. There is a fair road from Sierre to Montana, which can be used for motor-cars. Serviceable booklets and other information regarding the Simplon railways and connecting lines, and the Bernese Alpine Railway Berne-Loetschberg-Simplon, can be obtained from the Office Suisse de Tourisme, 6, Place Saint-François, Lausanne, Switzerland, and the London offices of the Swiss Federal Railways, 118, Regent Street, London, S.W.

plateau extending along the southern slopes of the Wildstrubel. It dominates the Rhone from Brigue to Martigny, and looks out on the ranges of snow-clad mountains reaching from the Simplon massif to Mont Blanc. Opposite Montana lies the Val d'Anniviers, backed by the Weisshorn, Zinal Rothorn, and Combin. An hour's climb affords glorious views of the Weissmies, Mischabelhörner, Matterhorn, Dent Blanche, Pigue d'Arolla, etc. Certainly Montana owes much to its position and picturesque setting. The far-extending mountains which lie to the south not only provide an ever-changing panorama of infinite beauty and endless delight, but serve to intercept rain-laden winds from the Mediterranean. The rainfall on the north side of the Rhone is low, and Montana is specially dry. The Wildstrubel and adjacent mountains provide admirable protection from north winds. No other centre in Switzerland enjoys so much sun, and at all seasons heliotherapy can be practised with greater advantage than elsewhere. There are no glaciers near Montana, and the place is in close proximity to Italy; and at all times of the year it is milder, dryer, and enjoys more sunshine than other health stations in Switzerland.

At Montana there are many interests for English patients. There is an English colony, an English church with an English chaplain in residence, an English doctor, and an ideal sanatorium—the Palace Hotel Sanatorium—now under a medical staff and management which is entirely British. There are several other sanatoria for tuberculous cases, which are conducted under Swiss management, and among these may be mentioned the Sanatorium Stephani, the Curhaus Victoria, the Sanatorium Populaire Genevois, and the Villa Lumière et Vie (for Belgian children suffering from surgical tuberculosis). There are a number of good hotels and pensions, and also a limited number of furnished chalets and flats are available. The shops provide all materials likely to be required by visitors. Montana is an ideal health station for tuberculous cases. There is no prejudice existing against this class of patient; indeed, some of the doctors, hotel proprietors, and shopkeepers are themselves arrested cases. The whole atmosphere and general environment of the place exercises a psychological influence which is of much importance. The plateau of Montana provides numerous opportunities for delightful walks and various forms of summer and winter sports. It is a centre where patients can be happy all the year round. Its elevated position makes it impossible to experience that sense of being shut in and oppressed which patients confined in valleys and in close proximity to mountains are wont to experience. For the healthy there are good golf-links and tennis-courts, and opportunities for wonderful walks and excursions; whilst in winter ski-ing, skating, sledge-running, tobogganing, curling, ice-hockey, and other sports can be enjoyed. The social life of the place

is such as must exercise a beneficial influence on the home-loving Britisher. Most patients become enthusiastic lovers of Montana.

The chief reason why Montana can now be so strongly recommended to English patients is dependent on the fact that there now



MONTANA: A SCENE IN SUMMER, WITH VIEW ACROSS THE RHONE VALLEY
TO THE WEISSHORN.

exists a sanatorium which is conducted entirely under British management, and at which the medical and nursing staff are British.¹ The

¹ Medical advisers and others desirous of obtaining plans of the Palace Hotel Sanatorium at Montana, with particulars regarding cost, may obtain all information on application to the Medical Superintendent. The inclusive fee ranges, according to position of room, from 20 to 40.50 francs a day. This includes a private bedroom, provision of electric light, full board (including Continental breakfast, *table d'hôte* luncheon and dinner, and afternoon tea), medical attendance, service of the

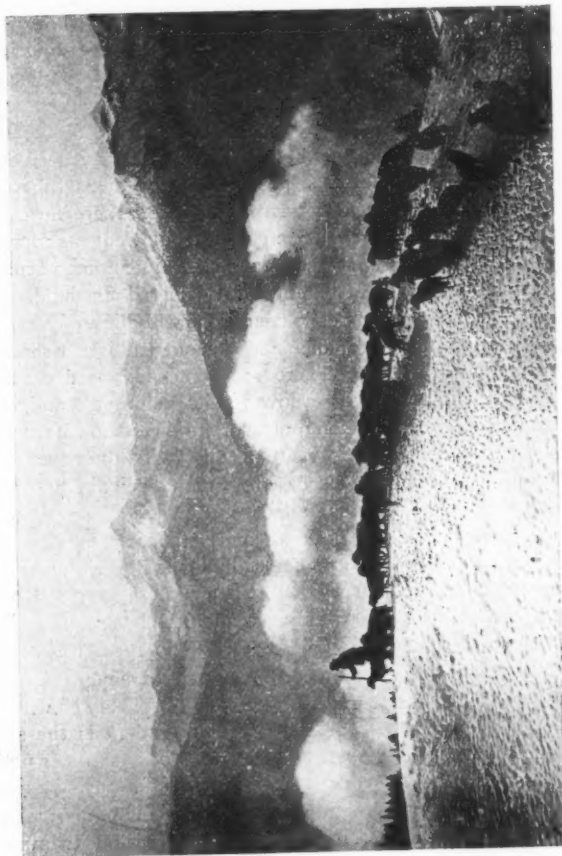
Palace Hotel was originally designed and built for a sanatorium under Swiss auspices. Subsequently it was taken over by the British Public Schools Alpine Sports Club as an all-the-year-round sports and touring centre, and it was specially approved as a winter station for winter sports, particularly ski-ing. With the coming of war in 1914 a sudden change occurred. Sportsmen and visitors all became absorbed in the grim struggle, and the Palace Hotel was turned into a sanatorium for French, Belgian, and Serbian *internés* suffering from tuberculosis. With the coming of peace the place was thoroughly cleaned, re-decorated, renovated, and equipped as an up-to-date sanatorium, and it was reopened in the summer of 1919. Many of the first patients were officers and ex-officers who had contracted tuberculosis during the war, and were sent to Switzerland under the auspices of Lady Dudley's Committee of the British Red Cross Society and the Ministry of Pensions.

I have recently had an opportunity of residing for some days in the sanatorium, and through the courtesy and kindness of the Medical Superintendent, Dr. Bernard Hudson, have enjoyed the privilege of interviewing and examining a number of the patients; and in this way I have not only been able to form an opinion of the advantages offered by Montana as a health station, but also of observing the special provisions available for British patients, and of ascertaining the views of those now undergoing treatment.¹ I have no hesitation in saying that at the Palace Hotel Sanatorium we now have an ideal centre for an all-the-year treatment of tuberculosis in practically every form. The cases likely to benefit most are those with early, limited, or chronic pulmonary tuberculous lesions, but, undoubtedly, many forms of so-called surgical tuberculosis and other affections likely to be advantaged by helio-therapeutic measures and hygienic management will gain much by residence here. It is most desirable that early and suitable cases who wish to avail themselves of the special advantages which may be derived from a stay in an Alpine station should be allowed to come to Montana as soon as possible after the trouble has been diagnosed. A great deal is lost by foolish procrastination in arriving at a definite diagnosis, and allowing unnecessary delay to occur before commencing treatment. There are, no doubt, a few contra-indications which should lead one to prohibit a resort to a high mountain station, but, provided that expert medical assistance and reliable nursing are available, they are probably much less numerous than was formerly

laboratory, and all ordinary nursing. In winter there is an extra charge of 3.50 francs per day for heating, which necessarily entails very heavy expense, where fuel and everything has to be brought by the funicular railway or by road transport from the Rhone Valley below.

¹ Medical advisers will find much helpful data in Dr. Bernard Hudson's Annual Reports for 1919-20 and 1920-21.

believed. Advanced cases should not, as a general rule, be sent anywhere abroad. Patients with uncompensated and extensive valvular and muscular disease of the heart are, of course, not suited for high altitudes. Of the so-called forms of surgical tuberculosis, those suffering from a mixed infection and with open wounds sometimes fail



MONTANA: A SCENE IN AUTUMN.

to react to helio-therapeutic and hygienic measures, but I have seen cases with extensive septic lesions improve under sun treatment.

Reference may here be made to certain "fetishes" which still exercise prejudicial influence. The old Victorian traditions die hard, and these, as far as they relate to the selection of medical cases for Alpine resorts, continue to control, at least to some extent, both public

and professional opinion in England. It is very necessary that such views should now be reconsidered. During recent years valuable physiological observations have been carried out on healthy subjects in regard to the influence of sunlight, altitude, and other climatic factors on nutrition, blood production, excretion, etc., and numerous communications have been published dealing with Alpine conditions in the treatment of tuberculosis and other morbid states. In view of recent researches and clinical experience, our opinions regarding contraindications must be revised. It is no longer necessary to insist on stages in the journey to an Alpine station. Patients can come direct from their own homes at sea-level to such a station as Montana without suffering any prejudice. In bygone days some authorities have taught that in the place where the patient developed his tuberculosis, and to which he will hope to return when cured, there he ought to undertake his "cure." Judged from a psychological standpoint, as well as in accordance with medical standards and common sense, this teaching must, to a very great extent, be considered unsound. When financial, professional, and domestic conditions will allow of a residence in an Alpine station, mere prejudice and ancient traditions should not be allowed to bar the way. There are some advanced cases who, knowing Switzerland and having a love for its mountains and valleys, desire to attempt to win back some measure of health on its uplands; these should not be denied their desire, at all events, until every aspect of the situation has been fully discussed. Some medical advisers seem to be under the impression that all cases in which hæmoptysis has occurred are to be considered unfit for an Alpine resort. The fact is that patients in whom the onset of the trouble has been evidenced by hæmorrhage often do exceedingly well. Even cases in which profuse hæmoptysis has taken place while at a mountain station not infrequently undergo satisfactory repair and suffer no recurrence. There are, no doubt, certain types where recurrent hæmoptysis occurs wherever the patient is sent, and for these it will probably be wisest not to select too elevated a place, particularly if the patient is the subject of a persistent high blood-pressure. Some doctors often deter patients from securing the benefits of an Alpine station by arousing anxieties regarding liability to a risk of cardiac distress or collapse. If there is no serious heart involvement, it is usually not desirable to raise this question. Lastly, reference may be made to laryngeal complications. In many cases of pulmonary tuberculosis some catarrhal involvement of the respiratory passages exists, and not infrequently slight inflammatory involvement of the larynx is present, and it may even possibly be of a tuberculous nature. The present tendency is to consider all such cases as unsuitable for the pure, rarefied, dry, stimulating air of the Alps, whereas many of these patients do admirably at a mountain station.

It is well to note here that at Montana many cases other than tuberculosis do well. Patients convalescing from various forms of illness usually improve quickly. Simple anæmias, and especially those dependent on malaria and certain other blood infections, generally gain



MONTANA : THE RINK OF THE PALACE HOTEL SANATORIUM.

much benefit. Some neurasthenic cases are considerably advantaged. Tuberculous and tuberculously disposed children with involvement of glands of the neck, intrathoracic structures, and abdomen, and with early lesions of bones and joints, generally do remarkably well under helio-therapeutic measures and sanatorium treatment, if such be scientifically carried out. At Montana, in the Châlet Lumière et Vie, many Belgian children suffering from surgical tuberculosis are under-

going treatment (especially helio-therapy) with excellent and striking results. I hope that before long there may be educational facilities at Montana for dealing with British children predisposed to tuberculosis.

The Palace Hotel Sanatorium can accommodate 110 patients, each having his or her own room. There are a number of sun-shelters, where helio-therapy can be advantageously and privately carried out. The place is admirably equipped, not only as regards the comfort and general well-being of each patient, but with all necessary means for the scientific management of every case. The patients' rooms, the corridors, the dining-hall, the lounge, and other apartments are provided with electric light and radiators, and there seems always to be an abundance of hot water. Special attention is devoted to the dietary, which is abundant and varied. There is an X-ray department, under the care of an expert radiologist. There have also been installed modern up-to-date appliances for the disinfection of sputum, clothes, bedding, and other articles in daily use by the patients. Every room, with the whole of its contents, is thoroughly disinfected on being vacated by a patient. There must be considerably less risk of contracting an infection in an establishment of this kind, where these precautions are properly observed, than in any ordinary hotel.

Unlike most sanatoria existing in England, there is a complete absence of "institutionalism." The aim of the medical staff is to treat every person as an individual and private patient, and to study the mentality and psychology of each case. I may say that I have never visited a similar establishment where the patients seem more happy and contented than they are at Montana. Dr. Bernard Hudson, the chief physician in charge, who has had a very wide experience, speaks very strongly of this aspect of dealing with the subjects of tuberculous disease, and believes firmly in the beneficial effect of a happy and contented disposition. It is good to be in a place where bureaucracy is inconspicuous, and where the relations between doctor and patient are of the best. There are numerous opportunities for patients to take up the study of French, German, and Italian; engage in literary or artistic pursuits; or enter upon various forms of manual work; and patients are encouraged to take up some suitable hobby.

The resident Medical Superintendent, Dr. Bernard Hudson—a well-known expert in tuberculosis—was formerly connected with the London Chest Hospital, and before the war practised at Davos, where he acted as British Consul, and was visiting physician to the Queen Alexandra Sanatorium. Dr. Hudson holds high British qualifications, and also the Swiss Federal Diploma of Medicine, and is therefore free to practise without restrictions both at home and throughout Switzerland. The nursing arrangements at the English Sanatorium at Montana are under the direction of Miss H. M. Barry, R.R.C., who is

assisted by an experienced staff of fully trained British nursing-sisters, coming from the best London and provincial hospitals. I can speak from experience and observation that the nursing is of a very efficient



MONTANA: THE GOLF LINKS.

and high order; patients are cared for in accordance with the highest British traditions.

This brief outline of facts and impressions has been prepared with the definite purpose of assisting British doctors and patients in forming an opinion as to existing ways and means for dealing with tuberculous subjects and other cases requiring sanatorium management in an Alpine station. I hope this short communication may be of practical service, and if there are any points to which reference has not been

made, and regarding which information is desired, I will do my best to reply to enquiries which may be sent to me by any medical practitioner.

I make bold to prophesy that in the near future Montana will be as popular with health-seeking and sports-loving Britishers as was Davos in bygone pre-war days. The development of Montana has been arrested by the Great Tragedy, but already there are numerous evidences of returning interests and a renewal of activities. Buildings of various kinds are in progress, and many new châteaux are being opened, while quite a number are in course of building. It should be noted that Montana now possesses a Medical Society of its own, and there is also a Committee of Development. Leading British and other medical advisers have recently visited the place, and there is at all times a constant coming and going of English and other visitors. Nature has richly endowed this beautiful Alpine station with powers making for recreation of mind and body and the recovery of disordered and diseased tissues, and if those who are responsible for its development have vision and act with sound judgment and with a far-reaching unselfishness, the day is not far distant when Montana will be the most favoured and popular among Switzerland's Alpine health and sports resorts.

THE
CLINICAL VALUE OF ARNETH'S LEUCOCYTES
COUNT AND DÖHLE'S INCLUSION BODIES IN
PULMONARY TUBERCULOSIS.

By TSUTOMU TOMINAGA,

M.D.,

Medical Director of Omi Sanitarium, Omi-Hachiman, Japan.

SINCE a marked shifting to the left of the neutrophile blood-picture in some infectious diseases was first reported by Arneth in 1904, many investigators have engaged in this interesting subject. Their results and opinions as to the clinical value of it are, however, very diverse. Some maintain the same opinion as Arneth himself as to the clinical value of the leucocytes count, while others fail to recognize the presence of such change in cases of pulmonary tuberculosis.

Döhle's leucocytic inclusion bodies were first found in scarlet fever and were thought to be the specific virus of the disease. But further investigations have proved that they are also found in several acute infectious diseases. Still, they maintain their clinical meaning, being an important indicator of the severity of the disease. When they appear it is taken to be a serious sign. As they disappear the case is thought to be improving.

Tuberculosis is in the main a typical disease which usually takes the chronic form. It sometimes manifests itself as acute pulmonary tuberculosis. Just as in other infectious diseases, tuberculosis may take an acute, galloping form which runs a short course. Having made observations of both chronic and acute cases of pulmonary tuberculosis, and, having examined these subjects in detail, I have come to the conclusion that Arneth's leucocytes count is, with few exceptions, useful for prognosis. It may also be proved that inclusion bodies appear in acute pulmonary tuberculosis, and their percentage in polymorphs increases with the severity of the disease.

The method I employed for staining the blood film was that of May-Grünwald. Painstaking care was taken in obtaining the blood film and in the preparation of the staining solution. The film obtained was at once allowed to dry in the air. I used May-Grünwald's stain, made by Grüber; methyl alcohol purissimus, by Merck; glycerin extra pure (double distilled, sp. gr. = 1.26), by Price's Co.; and aqua destillata prepared fresh for this special purpose. After being mixed together in the prescribed proportions, this preparation was once filtered, well corked, and kept in a cool, dark place. The blood was

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taken between ten and twelve o'clock. I counted 500 to 600 leucocytes in each case. The following tables show the results:

TABLE I.

Remarks: (-) No fever; (\pm) slight fever once in a while; (+) moderate fever; (+ +) high fever.

A. CHRONIC TUBERCULOSIS.

(1) *Incipient Cases.*

Case No.	Age, Sex.	Fever.	Arneth's Count—					Inclusion Bodies in per Cent.	Remarks.
			I.	II.	III.	IV.	V.		
1	20 M.	-	8	44	39	8	1	0	
2	21 M.	\pm	21	43	27	9	0	0	
3	25 M.	\pm	24	39	28	8	1	0.2	
4	32 F.	+	26	31	32	11	0	0	
5	26 M.	-	29	42	27	2	0	0	
6	26 F.	+	32	47	19	2	0	0.6	
7	27 F.	+	36	37	21	6	0	0	
8	37 F.	\pm	41	36	20	2	1	0	
9	32 M.	-	43	39	15	3	0	0.2	
10	25 M.	-	44	39	14	3	0	0	
11	25 M.	+	45	33	18	4	0	2.0	
12	26 F.	\pm	45	41	13	1	0	1.0	
13	26 M.	-	47	36	15	2	0	0	
14	21 F.	-	50	36	12	2	0	2.0	
15	24 M.	-	50	37	10	3	0	0	
16	22 M.	-	51	36	11	2	0	4.0	Tuberculin administration.
17	26 F.	-	52	32	12	3	1	1.0	
18	28 F.	-	52	39	9	1	0	?	
19	25 F.	-	54	31	13	2	0	0	
20	19 M.	-	59	23	13	5	0	0	Doing badly.
21	20 M.	+	60	31	7	1	1	0	
22	32 M.	-	64	25	10	1	0	2.0	
23	20 M.	+	65	26	8	1	0	4.0	Acute pleurisy complicated.
24	20 F.	+	67	29	4	0	0	0.2	
25	20 M.	\pm	79	17	3	1	0	5.0	Doing badly.

(2) *Moderately Advanced.*

Case No.	Age, Sex.	Fever.	Arneth's Count—					Inclusion Bodies in per Cent.	Remarks.
			I.	II.	III.	IV.	V.		
26	25 M.	+	44	38	16	2	0	10.0	High fever two months before the blood examination.
27	19 M.	-	51	31	16	2	0	0	
28	32 F.	-	54	31	13	2	0.2	1.0	
29	32 M.	-	55	30	13	2	0	?	
30	30 M.	-	63	26	10	1	0	0	
31	26 M.	-	69	24	7	0	0	1.0	
32	29 F.	-	70	26	4	0	0	2.0	
33	23 M.	-	70	27	3	0	0	2.5	Lesion widespread.
34	22 M.	+	77	18	4	1	0	0	Died after ten months.
35	27 F.	\pm	79	18	3	0	0	1.4	Three months later acute pneumonic form, died.

(3) *Far Advanced.*

Case No.	Age, Sex.	Fever.	Arneth's Count—					Inclusion Bodies in per Cent.	Remarks.
			I.	II.	III.	IV.	V.		
36	32 M.	±	64	27	7	2	0	0	
37	17 M.	±	67	28	4	1	0	4.0	
38	52 M.	+	69	22	7	2	0	0	
39	27 M.	+	69	24	6	1	0	0	
40	20 F.	-	76	21	3	0	0	0	Slowly deteriorating; died after one year.

B. ACUTE CASES.

Case No.	Age, Sex.	Fever.	Arneth's Count—					Inclusion Bodies in per Cent.	Remarks.
			I.	II.	III.	IV.	V.		
41	30 M.	++	59	32	8	1	0.2	2.0	
42	32 F.	++	61	30	8	1	0	4.0	
43	25 M.	++	62	32	6	1	0	8.0	Acute pneumonic phthisis.
44	19 F.	++	63	29	7	1	0	5.0	Chronic peritonitis complicated.
45	35 F.	++	68	26	5	1	0	8.0	
46	28 M.	++	69	26	4	1	0	?	Died after five days.
47	24 M.	++	71	25	3	1	0	4.0	
48	15 F.	++	71	27	2	0	0	3.0	Died after three months.
49	36 M.	++	72	22	6	0	0	12.0	Died after twenty-three days.
50	19 F.	++	75	20	5	0	0	0	Died after two months.
51	38 M.	++	80	19	1	0	0	16.8	Died after a week.

Is Arneth's Leucocytes Count Useful in Prognosis and Diagnosis?

A marked shifting of the leucocyte picture is sometimes found in early chronic cases. But it is invariably the case with more or less advanced cases. When the dislocation is considerable, no matter in what stage the case may be, further clinical observations prove that they are usually unfavourable. (Cases 20, 25, 33, 34, 35.) This evidence tends to show that it affords an important aid to prognosis.

I have two actual examples in which the diagnosis of tuberculosis was suggested by the examination of the blood film alone, and this was confirmed after a short period by physical and bacteriological examinations.

Case 1. Female, aged 21. General constitution good. I obtained the specimen of blood in order to examine the normal blood picture. Blood examination preceded physical examination. The result showed moderate dislocation to the left (Table II.). Two weeks later coughs and moderate fever gave warning. Careful examination revealed

a slight impairment of the left upper lobe. Tuberculous bacilli were found in the sputum after a month.

Case 2. Female, aged 21. Irregular symptoms at the beginning of the blood examination. The blood picture was shown in Table III.

TABLE II.

Case No.	Arneth's Count—					Inclusion Bodies in per Cent.
	I.	II.	III.	IV.	V.	
52	47	38	13	2	0	1'0

TABLE III.

Case No.	Arneth's Count—					Inclusion Bodies in per Cent.
	I.	II.	III.	IV.	V.	
14	50	36	12	2	0	2'0

A few months later, slight elevation of the body temperature, pains in the backbone, sure evidence of catarrh in the apex of the right lung.

It is thus evident that Arneth's method is sometimes helpful for the early diagnosis of pulmonary tuberculosis.

Döhle's Inclusion Bodies in Pulmonary Tuberculosis.

Inclusion bodies are generally not found in chronic pulmonary tuberculosis. When they are found at all in such cases, their number is very small. Those who had them in higher percentages were invariably either acute cases or those who had just recovered from a high fever. (Cases 23 and 26.) It is a matter of considerable interest to notice that one who had undergone tuberculin administration for a time had inclusion bodies in the leucocytes to the extent of 4 per cent. of all neutrophils, in spite of the fact that the case was slowly improving. (Case 16.)

Döhle's inclusion bodies are generally situated near the periphery of the cells, but sometimes they are found near the centre or between the nuclei. The shape is generally round or oval, the number being one for the most part. They have no direct connection with any part of the nuclei.

The leucocytes which contain the inclusion bodies may be classified according to their nuclear segments, the same as Arneth's; 64 per cent.

ARNETH'S LEUCOCYTES IN TUBERCULOSIS 163

of them belonged to the cells of class I., 27 per cent. to those of class II., and 8 per cent. to class III. They seem to be rarely, if ever, found in cells of classes IV. and V. (See Table IV.)

TABLE IV.

Case No.	Age, Sex.	Fever.	Percentage of Inclusion Bodies in each Class.					Total Inclusion Bodies in per Cent.	Remarks.
			I.	II.	III.	IV.	V.		
16	22 M.	-	2.6	0.8	0.2	0	0	3.6	Tuberculin administration.
23	20 M.	+	2.8	0.6	0.8	0	0	4.2	
25	20 M.	±	3.5	1.0	0.5	0	0	5.0	
26	25 M.	+	4.0	4.0	2.0	0	0	10.0	High fever at first consultation.
33	23 M.	-	1.8	0.2	0	0	0	2.0	
37	17 M.	±	2.3	1.7	0	0	0	4.0	
42	32 F.	++	1.7	2.0	0.3	0	0	4.0	
43	25 M.	++	5.2	2.0	0.6	0	0	7.8	
43	25 M.	+	5.0	2.5	1.0	0	0	8.5	
44	19 F.	++	3.2	1.4	0.6	0	0	5.2	
45	35 F.	++	4.8	3.0	0.7	0	0	8.5	
49	36 M.	++	9.0	2.5	0.5	0	0	12.0	
51	38 M.	++	13.0	3.2	0.4	0.2	0	16.8	Died eight days later.
Average (per cent.)			64.0	27.0	8.3	0.7	0		

Clinical Value of Inclusion Bodies.

Inclusion bodies have a close relation to fever. They appear or disappear with the rise or fall of the temperature. When they appear in more than 5 per cent. of all neutrophils, it is an unfavourable sign. When they disappear the clinical course may be said to have turned toward a favourable condition. In my experience, cases that have them constantly in higher percentages have ultimately ended in death. The following tables show how the clinical course of pulmonary tuberculosis goes parallel with "Arneth's" and "Döhle."

TABLE V.

(1) IMPROVING CASES.

Case No.	Age, Sex.	Fever.	Arneth's Count—					Inclusion Bodies in per Cent.	Remarks.
			I.	II.	III.	IV.	V.		
2.	21 M.	±	21	43	27	9	0	0	Slight lesion in one apex.
		-	17	39	38	5	1	0	Re-examination of blood after seven months; arrested.
26.	25 M.	+	44	38	16	2	0	10.0	Infiltration of the left lung; active.
		-	26	44	26	3	1	0	Re-examination after two months; much improved.

(2) NO CHANGE.

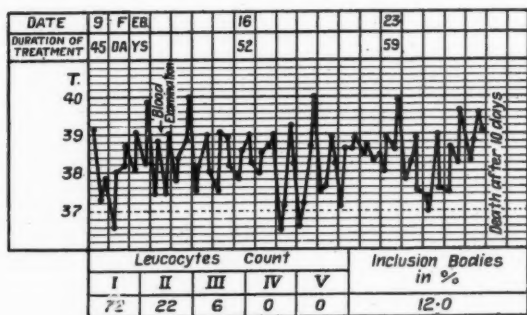
Case No.	Age, Sex.	Fever.	Arneth's Count—					Inclusion Bodies in per Cent.	Remarks.
			I.	II.	III.	IV.	V.		
II.	25 M.	+	45	33	18	4	0.4	2.0	With pleurisy in the right lung. After two months, no change.
		+	44	39	14	3	0.2	0.6	
43.	25 M.	++	62	32	6	1	0	8.0	Acute pneumonic form. After two months.
		+	58	32	9	1	0	8.5	

(3) DEAD.

Case No.	Age, Sex.	Fever.	Arneth's Count—					Inclusion Bodies in per Cent.	Remarks.
			I.	II.	III.	IV.	V.		
50.	19 F.	++	75	20	5	0	0	0	Main trouble in kidney. Lung affection slight; gradual decline. After one month re-examination; disease still active. Lived two months.
		++	89	9	2	0	0	0	

The following charts explain the correlation more plainly :

CHART I.—IMPROVING CASE. (Case No. 26.)



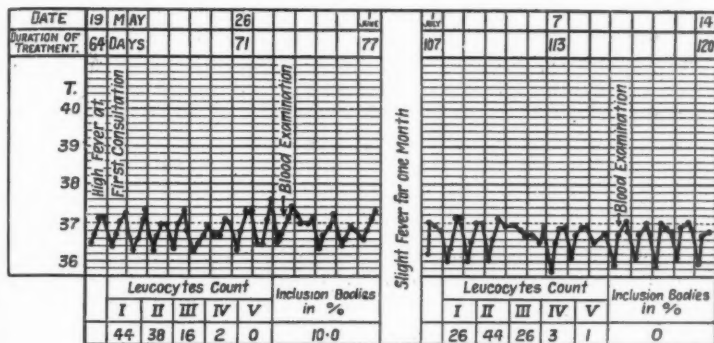
Conclusions.

1. Arneth's leucocytes count goes usually hand in hand with the clinical course of pulmonary tuberculosis.
2. Döhle's inclusion bodies are also found in some tuberculous cases. They appear or disappear according to the fever.

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3. Marked dislocation of Arneth's leucocyte picture and the presence of inclusion bodies in more than 5 per cent. of all neutrophils are a help to the diagnosis and prognosis of pulmonary tuberculosis.

CHART II.—FAR ADVANCED CASE. (Case No. 49.)



4. Inclusion bodies are found in the proportions of: 64 per cent. in the leucocytes of the first class; 27 per cent. in those of the second class; 8 per cent. in those of the third.

OBSERVATIONS ON PNEUMOTHORAX THERAPY.¹

By Z. P. FERNANDEZ,

B.A., M.D.,

Hon. Assistant Physician, Armley Sanatorium, and Assistant Tuberculosis Officer to the City of Leeds.

THE unbiased remark of a chief tuberculosis clinician of a large County Council that pneumothorax treatment in well-selected cases is the most important advance in phthisis therapy during the last ten years in this country is supported by unanimity of opinion. I have heard of nobody with experience in this work give it up as unsatisfactory. (Reading through the proof I notice similar remarks at the Royal Society discussions in May on the subject.) From a preventive view, the control of infective expectoration is an advantage not sufficiently recognized. In severe and continued hæmoptysis, occasionally a fatal termination or exacerbation of pulmonary tuberculosis, the treatment is now be-

¹ Based on a report to the Medical Research Council.

coming a routine measure as an operation for an abdominal catastrophe. Clive Riviere's book on the subject records a partially successful case only. However, experience of other observers has endorsed the above view when the site of lesion is evident. It is an operation for a tactful and patient physician with time at his disposal. A novice or a careless operator would dishearten the patient in an institution if a case or two went wrong. On the operator rather than on the operation will depend the success of a case. Dangers, though rarely unavoidable, as in minor surgery, are often the result of impatience, bad selection, faulty apparatus, or careless technique. Treatment carried out in a dispensary or at home when conditions permit often saves the prolonged stay of a patient in a sanatorium. He is able to continue his work whilst receiving treatment. Thanks to Dr. H. de Carle Woodcock, who introduced the treatment in Leeds, our work on the above lines has been an effective saving for the City Council. Dr. C. Rolleston, of soke of Peterborough, relies on this method in the absence of sufficient sanatorium accommodation. Though not a panacea for all types of cases, the proportion of suitable cases treated in England is still far too small. The gain of the confidence of the patient is an asset, and no doubt he is the best judge of its efficacy who comes of his freewill for a refill. In future, tuberculosis schemes will need specialists in this work if the claim put forth is justifiable.

After-Result of Cases Traced.

Dr. Sachs had to rely on twenty-four observers in America to collect 1,145 cases for several years. To avoid overlapping of the same case treated by two or three of us, and to ascertain an approximate after-result, I was able to get a list of seventy cases from Dr. J. A. M. Clark, now Tuberculosis Officer, Walsall. He was the first to be associated with Dr. Woodcock during a period when the work was carried out on a large scale. The cases were treated by them until he left Leeds City Sanatorium in August, 1914. Sixty per cent. of these cases are now known to be dead. Considering many were of advanced disease, and as the treatment had not been kept up as at present, the result is in no way disappointing. Figures of Dr. N. Gebbie, who followed Dr. Clark and continued the treatment in a number of the above cases with Dr. Woodcock, have not been available. Fifty cases I treated from September, 1917, to March, 1919, have been analyzed in the *Practitioner*, June, 1920, with twenty-eight dead and 42 per cent. doing well at present. Cases previously treated by Dr. Woodcock and a few by Dr. Gebbie or Dr. Jervis occur in this list. Since then cases treated by me till May last exclusive of refills for cases under Dr. Woodcock number sixty-two, with fourteen deaths. I have not, however, traced all cases of Dr. Woodcock. Seventy-eight deaths recorded

in 160 pneumothorax case charts collected at random support the conclusion that 50 per cent. of cases, in spite of the advanced type of disease, survive a period longer than possible by other lines of treatment. Though for twelve months ending December, 1920, over 100 cases had pneumothorax treatment in Leeds, which is probably larger than the work in other cities, I have no doubt, with over 5,500 cases of phthisis, there is field for increased work in this direction.

Indications for Treatment.

1. *Severe and Continued Hæmoptysis.*—In cases of bilateral disease, to decide the site of lesion is at times difficult. The patient sometimes will give you an indication of the bleeding side when questioned. Generally he lies on the non-bleeding side. Blood-pressure observations I have followed since 1918 support the observation of Dr. R. J. Cyriax in this journal (April, 1919) that systolic pressure increases during hæmoptysis on the bleeding side. My observations, carried out with a Tycos' sphygmomanometer, and recorded in a thesis on pneumothorax treatment, indicated that the pulse-pressure also increased on the bleeding side; soon after pneumothorax treatment the pressure generally decreased, more so in hæmoptysis cases on the bleeding side. In ordinary cases after induction my experience was in the majority that there was a lowering of pressure immediately, which, however, improved as the patient's condition got better in cases of low pressure. Though one has to bear in mind that the side with extensive disease is not always the cause of bleeding, it will be wiser to treat the suspected side with a small dose, and watch the effect before increasing it, chiefly if lesion is slightly moderate on both sides. Bilateral inductions in my experience do no harm, and two cases I recorded in the *British Medical Journal*, July 20, 1918, are still doing well. A patient may bleed from different sides on two occasions. In one case death resulted from the non-treated side when previous hæmorrhage was controlled by pneumothorax treatment.

2. *Continued Pyrexia over 100° F.*—(a) Unilateral disease with severe or moderate systemic disturbance and fair resistance. (b) Bilateral disease with more extensive disease on one side, systemic disturbance and resistance as above.

3. *Apyrexial Cases.*—(a) Unilateral cases with extensive disintegrative signs and systemic disturbance. (b) Bilateral cases with sufficient healthy lung on either side, with moderate systemic disturbance and good resistance. Bilateral induction in experienced hands with small amount of gas is beneficial. If pyrexia present, it improves.

4. *Abscess or Early Gangrene of Lung.*—Also certain cases of recent

bronchiectasis. A girl of school age with bronchiectasis and hæmoptysis, treated in 1918, has remarkably improved.

5. *Pleural Effusion or Tuberculous Empyema*.—By aspiration and oxygen replacement I have admitted and treated six cases. In two the treatment was begun during the year by Dr. Woodcock, and continued by me, with condition arrested in one and death in the other after some improvement.

6. *Post-Operative Continued Discharging Sinus*.—Three cases of operated empyema have been treated—one arrested, another recent but improving, and the third treated by pneumothorax since November last. She was operated on ten months previously, with profuse discharge ever since, bedridden all the time. She has had twelve inductions in her home as a domiciliary case in co-operation with her doctor, Dr. C. H. Moorhouse. She has so much improved that we have let her go to her home in Belgium for a holiday. She had only a little thin discharge, and that occasionally. Tubercle bacillus was cultivated from the pus. In empyema cases, aspiration followed by gas replacement, first advocated by Dr. Morriston Davies, is an advantage to thoracoplasty when induction is possible, with re-expansion of lung later after previous immobilization. In a pyrexial case treated last year, condition subsided after six weeks, and a recent X-ray report stated the lung has fully re-expanded.

7. Cases of recent onset, with progressive disease, not reacting to sanatorium measures.

Contra-Indications.

1. Extensive bilateral disease, with severe or moderate systemic disturbance and poor resistance, in which hopeless prognosis is evident.
2. Marked fibrosis, with chronic bronchitis and emphysema.
3. Pulmonary tuberculosis associated with (a) intestinal complication and diarrhoea. (b) Advanced laryngeal ulceration. Slight or moderate disease may be benefited. (c) Multiple cold abscess. I have known three cases treated with large dose of gas develop multiple abscess, which the patients blamed pneumothorax treatment for. In two of these cachexia followed ulcerative condition, terminating fatally. Last two years I have not come across such cases. (d) Cardiac valvular or myocardial degenerative or cardio-vascular disease. Early tuberculous tachycardia or toxic dyspnoea not a contra-indication, and often benefited. (e) Other severe illness or malignant disease. (f) Chronic nephritis. (g) Neurotic tendency or mental stigma.
4. Asthma.
5. Generalized or acute miliary type.
6. Cases with initial negative inspiratory pressure of less than 1 cm. of water, with little respiratory oscillation, which repeatedly

show no satisfactory alteration. I have known, however, cases after a few inductions improve, with satisfactory oscillation and increased negative reading.

Bilateral Pneumothorax.

Of six cases published in the *Practitioner*, June, 1920, three are still alive, and their condition is satisfactory. In my second series of six cases, only in one, though pyrexia was controlled, the prognosis is not satisfactory. Bilateral induction needs careful selection, and has no doubt its value. Dosage also should be small. The use of it is evident in cases treated who show in later period exacerbation on the non-treated and originally less active side, as in a case in the necropsy report below who had been treated with large dosage. As a rule, if induction of 300 to 500 c.c. of gas only is given at regulated intervals, and the intrapleural pressure thereby altered and kept within negative limit, not much harm is done to the other lung. Cardiac and mediastinal displacement are also avoided.

On the Choice of Gas.

I have emphasized elsewhere my experience of the use of oxygen.¹ Apart from the actual therapeutic value, Professor Benjamin Moore has published² and confirmed on personal conversation the inhibitory action of oxygen on tubercle bacillus. The use of nitrogen was on the supposition of its being less absorbed. Granting this to be true, dosage at intervals, as pointed out before, will keep up the immobilization and rest necessary. The percentage of effusion in those advocating nitrogen is fairly high compared to our experience in Leeds. In a recent correspondence with a pneumothorax worker who does not advocate massive induction, I was able to conclude he used nitrogen, because of the cases of effusion, which was confirmed by his reply. Air other than in an industrial town is equally good. Oxygen cylinders are easily available, and there is no fear of any impurity. A cylinder will last for several cases.

Accidents or Complications.

In my first series of fifty I was fortunate to have no accident. Only one of these cases who was treated by large dosage developed effusion, which was treated by aspiration and oxygen replacement successfully. He died, however, from influenza during the epidemic in 1918. In cases treated by large dosage pain and dyspnoea have been more characteristic on the night of induction than in my later cases. A case of continued hæmoptysis who refused treatment for a long time died, as quoted in the *Practitioner*, June, 1920, the day after he had a small

¹ *Practitioner*, June, 1920.

² See *British Medical Journal*, 1912, p. 108.

induction of severe hæmoptysis. Necropsy impression was that earlier and repeated induction might have altered the fatal event. In my second series on February 10, 1920, after the fifth induction a patient soon after the novocain and adrenalin solution was put in complained of dizziness, haziness, and lost the use of the right arm for three minutes. The pupils were dilated slightly and squinted. His heart was massaged, strychnine injected, hot bottle put on, and brandy given. He soon came round, though no gas was given. He was being treated on the left side, and had subsequently six inductions. His condition was so quiescent, he worked as a porter at the sanatorium, when he caught a cold, developed signs of meningitis about the middle of October, and died November 13, 1920. Lumbar puncture was done, and tubercle culture was obtained from the cerebro-spinal fluid with gentian-violet egg-broth medium. As another case of pleural reflex occurred about the same time, we had to fear the supply of the novocain just recently got was partially at fault, and after fresh supply I had not a similar experience. In the above case I got a history of fainting on three occasions after a knock. Recently I had a pneumothorax case develop pleural effusion, which was treated by aspiration and oxygen replacement. Pyrexia subsided, and X-ray showed no signs of fluid. A cold which developed during the day of the induction resulted in effusion. He has had several refills and his condition is satisfactory. Surgical emphysema may result from want of care. Do not attempt more than three punctures on the same day. See the water used to displace gas is tepid and not too cold. Use local anaesthesia. Avoid massive dose in ordinary cases, being justifiable probably in a violent hæmoptysis when site of lesion is known.

Technique and General Management.

The site of election is the fifth or sixth space about the anterior axillary line. In a left-sided case the puncture should be a little further out. In a skiagraph Dr. Scargill took for me I had the opportunity of leaving the needle on the chest, and was able to notice the needle put in the exact mid-space had just missed the edge of the rib. This position thus avoids the bloodvessels and the pain of injuring the periosteum of the ribs.

The single-needle method first practised by Dr. Woodcock, and since adopted by me, has always been found very convenient. It not only saves two punctures, but lessens the traumatic effect of the stouter Lillingston type needle we used before. After freezing the site prepared with ethyl chloride spray, we use a 5-c.c. record syringe needle fitted on to the hyposyringe containing about 1 c.c. of novocain 2 per cent. and adrenalin solution for slowly inserting into the intercostal space.

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After a few minutes the syringe is removed, and the rubber tube directly attached to the needle without its being taken out.

The apparatus in use in Leeds since last August is one Dr. Woodcock and myself remodelled, and described elsewhere. The idea of Dr. W. Parry Morgan with double manometer throttle in the *Lancet*, July 11, 1914, has been the basis of the alteration. The two cylinders are movable, and no inconvenience is noticed as gas cylinder gets displaced by water. The manometers are, as in Dr. Woodcock's former pattern, single tubes immersed in a cylinder of water. The differential regulation effected by a screw-shunt regulator and dial gives typical indications in the two manometers of flow of gas, obstruction in needle, etc. The authors have ceased to use the former pattern, which has been a very serviceable apparatus. Messrs. Reynolds and Branson, Leeds, have already supplied this apparatus to others, and it is easily worked. Cases in which respiratory oscillation has not been satisfactory with former apparatus have been effectively treated. The following case is typical: three years' history of onset, with cavitative lesions involving mainly the right lung. Inductions begun January, 1920, failure first time. Twelve further attempts were made till July with former apparatus with failure on three occasions. Only 50 c.c. given on two occasions, and that after a considerable time; 100 c.c. given twice, once the time taken being about an hour. On the other occasions one was never able to give more than 400 c.c., and the time taken being always considerably long, requiring often an hour. The initial negative rise was scarcely above $\frac{1}{4}$ to $\frac{1}{2}$ inch, except once, when it was 1 inch. After the newer apparatus was in use, I have without failure given him now twelve inductions of 400 to 500 c.c., in considerably less time, with generally a good negative rise. Only once the rise was not satisfactory, though fluctuation was very slight when the gas tap was off. If respiratory manometric fluctuation is not satisfactory when gas tap is off, in the new apparatus one can safely open the gas tap as an additional guide. Flow of gas towards chest will only take place if the pressure in the manometer proximal to chest is lesser than that of the distal manometer. If greater, a back flow will result. If equal and with no oscillation, there is obstruction in the needle. Obstruction due to blood or débris is easily rectified. If moderate adhesions, slowly raise pressure in distal manometer. Preferably gas is allowed to flow at first by suction with the distal manometer marking zero or negative pressure.

I have been often asked how much time is required for the operation. As pointed out before, though one gets many straightforward cases, time and perseverance are essential. Comparatively slow induction is safer than hurried work. I find one can conveniently do fourteen cases with a moderate quantity of gas in four and a half to five hours, which is

my routine for a day in the week at Armley Sanatorium. In domiciliary work for a four hours' morning round in a car one could do three cases in addition to some visits, thereby saving the car expense, which might be raised as an expensive item for treatment at home. Thus, one sees it takes about twenty operations for a week to get about 1,000 inductions for the year. Patients treated in the dispensary are better done in the afternoon. A good many get away soon after the operation. I prefer an afternoon with evening clinic, so that any case that has to rest longer is under supervision for a prolonged period.

I now give my refills at first weekly, except in certain hæmoptysis cases. There is no doubt the induction must be continued at longer intervals. It is not fair to the treatment to include cases who had two or three inductions as cases treated in any analysis of result. I have three cases who had treatment over thirty-five times in three years.

Manometric Oscillations.

After the initial operation of 200 c.c. of gas the change of pressure is scarcely 1 or 2 cm. of water. In my opinion, an inspiratory excursion is more reliable than the expiratory reading. The positive final pressure recorded by certain observers after a refill of 300 to 500 c.c. of gas is, in my opinion, in many cases due to reading taken too soon after the gas tap has been cut off. The excessive positive pressure used for flow of gas towards chest has an inertia of movement which continues to show a pressure in the positive direction even when the gas tap is cut off. One too readily regards, then, such pressure as a final intrapleural positive pressure. I have myself recorded formerly positive pressure. For last two years after this observation has been made I have not erred in that direction. Again, one notices how a day after induction a good negative rise is again got. So is the case in refills after two or three years. In a case Dr. Stansfield radiographed soon after the twelfth induction with 800 c.c. gas, when the lung was collapsed to the border of the heart, I got a negative initial inspiratory rise of 10 cm. water, and after induction negative rise of 8 cm. To save time, when one is in doubt the needle may be disconnected, and reading taken a little while after reconnection. Dosage is better timed with change noticed in the initial and final pressures observed. Want of satisfactory oscillation, when the gas tap is cut off and needle is in the chest, is due mainly from blood, even in the form of staining, tissue débris, adhesions, or puncture of lung. Though advocated elsewhere to test for blood with a hypo-syringe, it is only possible when the bleeding is more than ordinary, and when clot in the needle does not prevent the aspirating action of the syringe. Passing a stilette through needle in chest will clear the staining, or reveal the presence of oozing. In that case a further

puncture after the needle has been cleared and sterilized is the procedure to get a good oscillation. Débris may also be cleared this way. Also see your needle is clear before insertion into the chest. In the case of adhesion, which in my first series formed 18 per cent. in bilateral disease, I could not continue the treatment, and these eventually died. The newer apparatus may be of value in some of these cases, as for last ten months I have scarcely had one case of difficulty. In empyema and oxygen replacement adhesions often gave difficulty in obtaining satisfactory oscillations with former apparatus. I have treated, as detailed above, such cases easily after the modification in the apparatus. Change of site in adhesions may help. Size of needle, type of breathing, etc., vary manometric reading, whose value is essential, but only relative.

Necropsy Notes.

In the literature in this country no personal records have come to my notice in going through the papers published. The following records I had the opportunity to keep for that reason will be of interest:

1. Acute febrile case. Cavity signs left lung, and slight infiltration right lung; four months previously to induction treatment confined to bed. Ten inductions left lung during seven months, and discharged from sanatorium afebrile; able to be about for three months, when he caught a cold, followed by hæmoptysis and acute tuberculous bronchopneumonic condition of the right lung, which proved fatal. The following post-mortem notes were then made by me: "The left lung showed a fibrous capsuled cavity of the size of an orange, with marked fibrosis of both lobes. The visceral pleura was markedly thickened with bands of adhesions, which were separable. The left lung evidently was the seat of primary disease, but showed evidence of healing, with little purulent matter. The right lung was in a stage of red hepatization, with scattered tubercles, evidently of later onset, and the pleura was not thickened. Small cavities were also present." The following histological report was kindly made for me by Professor M. J. Stewart, of the Leeds University, a year after, without knowing the macroscopic report, and which he permitted me to publish:

"Left lung, pleura greatly thickened. Lung tissue shows extensive caseous areas, mainly surrounded by well-marked zones of fibroblastic proliferation, and obviously of long standing. The intervening parts of lung tissue show desquamation of the alveolar epithelium. There are a few areas of more recent caseation, with here and there a typical tuberculous giant cell.

"Right lung, the pleura is not thickened. There are recent caseous areas of small size, mostly without any surrounding fibrous zone. A few typical giant cells are seen. There is very marked catarrh of the

intervening lung tissue. This lesion is a much more acute one than in the left lung." One aware of Professor Stewart's histological work was not the least surprised with the corroborating evidence of the previously written necropsy report. With my present experience I should have had no hesitation in treating the right side in such a case now.

2. Girl who had nine inductions left lung under Dr. Woodcock and Dr. Gebbie in 1916 had two inductions in 1918. Her mental condition prevented me from continuing the treatment, and she died three months after last induction. Necropsy revealed healed fibrotic cavities of left lung, with marked thickening of pleura, and recent active fibro-caseation of right lung and ulceration of larynx. In another case treated by them I had the opportunity to do the necropsy four years later; I found complete destruction of left upper lobe in front, and the parietal and visceral pleura were thickened and adherent. Behind there was lung tissue of fibrotic type. Right lung was in a state of red hepatization. Trachea and larynx showed ulceration. In other cases there was always evidence of improvement in the treated side.

If the above observations will be of some use to those who are interested in this treatment, which I have no doubt justifies the statement made in the beginning, I shall feel more than repaid.

SHELTERS FOR TUBERCULOUS PATIENTS.

By JOHN RITCHIE,

M.B., CH.B., D.P.H.,

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THAT the tuberculous patient is provided with a shelter to supply the deficiencies of his house may be a commonplace, but it is one which has a wider application than at first appears. In this, as in all matters affecting health, the house is something more than an arrangement of stone and lime, to be described in terms of floor-space, window area, and drainage. It is an environment, moulding for good or ill its inhabitants, influencing in the profoundest way their mentality, determining the decencies and amenities of their lives, and not seldom is the deciding factor in the outcome of disease. Recognized and treated sufficiently early, the tuberculous patient too often returns from the sanatorium to find that "his house is the way to the grave, leading down to the chambers of death," and it behoves us who are responsible to see that he is given a chance of fighting his battle in some more favourable arena.

In Dumfriesshire, which is almost entirely an agricultural county, and where many of the country cottages are quite unsuited for treating invalids of any sort, the provision of shelters by the County Council has gone some way to meet the difficulty. Besides the incidental advantage of permitting the period of sanatorium treatment to be shortened, their use is twofold: (1) To benefit the patient in the early stages; (2) to protect contacts of advanced cases. In many instances, of course, both factors are operative. Previous experience in a sanatorium is desirable if the patient is to make the best use of his shelter, though in cases where one's chief object is to remove a source of infection from the household this is less important.

With patients widely scattered over a large area, it is necessary that shelter-life be made as attractive as possible to ensure its being carried out properly in the intervals of the Tuberculosis Officer's visits. The type of shelter we have found satisfactory for rural work is shown in the accompanying plan. The floor area is $7\frac{1}{2}$ feet by $7\frac{1}{2}$ feet, height of walls 6 feet to eaves and $8\frac{1}{2}$ feet to roof-ridge. The roof projects, so as to afford protection from rain, and is covered with water-proof felt. The upper half of each wall consists of removable panels, manipulated from within, so that any side can be opened or closed at will. The pre-war cost of these shelters was £12 10s.; it is now £21 10s. Revolving shelters, experimented with in former years, have proved less satisfactory for rural work than the type described, though excellent on permanent sites where they can be supervised.

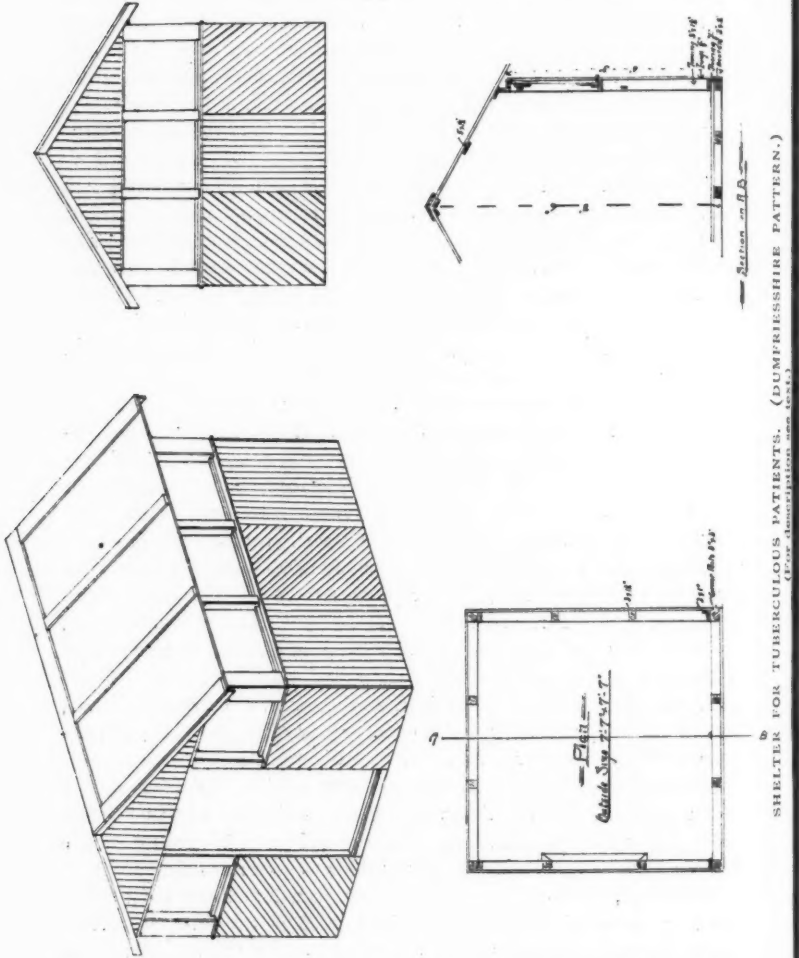
Being made in sections, the shelters are easily transportable by train or cart, and can be erected or repaired by any country joiner. The floor area, it will be noted, is over 56 square feet. This has several advantages—the centre of the floor can be kept clean in wet weather, and the shelter can be fitted up with some regard to comfort—even the simplest life is enriched by a chair and table! If his condition permit, the patient may indulge in a hobby, or even carry on a trade, while living under open-air conditions. I have known boots, picture-frames, even sermons, produced under such circumstances.

To the period for which shelters are used no limit has been set. I have at present several patients under supervision who have lived in them for over six years, and I have never deprived of his shelter anyone who was using it properly, and was anxious to continue doing so.

As a rule, patients rapidly become accustomed to shelter-life, especially when it is possible to begin it in spring or summer. With nervous people, it is permissible to allow the shelter to be used, at first, during the day only; it will not be long, in most instances, before it is occupied by night also. A little forethought in arranging that the site is not overlooked from a public road, nor subject to raids by domestic animals, is well repaid, and such small contrivances as a bell, whereby

the patient can communicate with his household, are often much more important than they seem.

In favourable cases there is generally an early disappearance of night-sweats, sleep becomes easier and appetite less capricious. The



improvement in mental outlook is often still more striking. In the early stages it augurs well for the patient's chances, and, in the advanced, lessens the strain on himself and his friends.

The point which I desire specially to emphasize is the importance of

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using a shelter of reasonable dimensions, so that it may come to be regarded as a place for *living* in—not merely for *sleeping* in. This distinction is not trifling, it is of fundamental importance. Shelter-life, to be successful, means more than an unlimited supply of fresh air. It is a new environment, wherein the invalid, freed from every unnecessary worry, is enabled to devote all his energy, quietly and unconsciously, to overcome his disease. Even in health, the noises, the smells, the wearying routine and irritating distractions, inseparable from life in a cottage, are sufficiently trying, much more so in disease; nor is it small matter that the patient should be relieved of them, and allowed to find his best hope of cure in the rest for body and mind which comes to those who exchange a smoked ceiling for the clouds, and learn to sleep, untroubled, beneath the stars.

INSTITUTIONS FOR THE TUBERCULOUS.

KING GEORGE'S SANATORIUM FOR SAILORS, BRAMSHOTT, NEAR LIPHOOK, HANTS.

THIS newly established sanatorium is a branch of the Seamen's Hospital Society, and is intended to receive such sailors suffering from tuberculosis who present themselves at the Dreadnought Hospital at Greenwich. The building has been erected with the aid of, and in accordance with, the view of the Ministry of Health, and is a two-storied pavilion providing accommodation for eighty patients. The chief pavilion consists of four ten-bedded wards and thirty-two small wards, consisting of twenty-four single-bedded wards and eight wards each with two beds. The wards have been constructed in accordance with modern hygienic requirements: the corners of the rooms are rounded and the floors are jointless. A mansion standing in the grounds has been converted into nurses' quarters, and the Resident Medical Officer is located in a house on the estate. Bramshott is situated 400 feet above sea-level, on a dry soil, and sheltered from the north. The sanatorium is surrounded by about 100 acres, so that there is ample space for extension. The sanatorium is provided with a complete medical equipment, including an operating-theatre and X-ray room. Excellent provision is made for the patients' comfort, there being two recreation-rooms, a croquet lawn, bowling green, and every sort of game which they could possibly wish for. It is intended that sufficient vegetables shall be grown to provide for the whole sanatorium all the year round. There is one great advantage which this institution has over the large majority of other public sanatoria, and that is that patients may be retained for an indefinite time, and if cases can be admitted sufficiently early there is every chance that the results will be good. Too often seamen carry on with their work till they "drop," and therefore the likelihood of getting early cases is rather remote. The Secretary of the Seamen's Hospital Society, Sir James Michelli, C.M.G., has rendered valuable service in connection with the building of the sanatorium, and has taken throughout a very keen interest in all the proceedings. Mr. A. D. Robinson, A.R.I.B.A., of the firm of Messrs. Colcutt and Stamp, the Resident Architect, whose artistic designing and practical workmanship are generally recognized, has been of invaluable assistance in the development of the sanatorium. The Medical Superintendent is Dr. H. Sharpe, who will be glad to supply full particulars.

NOTICES OF BOOKS.

TUBERCULOSIS IN INDIA.

"CONSIDERING the wide prevalence of tuberculosis throughout the East Indian Empire, and the recognition of that prevalence both by the medical profession and by the people themselves, it is somewhat surprising that India has hitherto received so little attention from writers on the disease." These are the opening words of the preface of Dr. Arthur Lankester's new and enlightening work on tuberculosis in India.¹ The book is the outcome of a special investigation undertaken by the author under the auspices of the Research Fund Association of the Indian Government, during which nearly 35,000 miles were travelled in India and Burma, and 85 cities visited, including 29 of the 30 which contain a population of over 100,000 inhabitants. The author, from his twenty-three years of experience of medical work in India and his wide knowledge of the land and its peoples, was admirably fitted to enter on the difficult task, and, as his work testifies, it has been undertaken with enthusiasm, and carried through with much thoroughness, scientific precision being lappily blended with sympathy, tact, and understanding. The work has been written in a form which, while of service to the trained doctor, will be clear to all thoughtful men and women. It is a monograph which deserves the study of all medicals interested in tuberculosis, and we specially commend it to the consideration of missionaries, educationalists, merchants, and all others interested in the well-being of the natives of India. The volume is divided into three parts, dealing respectively with the prevalence, causation, and prevention of tuberculosis in India. Dr. Lankester has been faced by an insurmountable difficulty—the poverty and unreliability of statistics. He has, however, gathered data from many and varied sources, all of which go to show that tuberculosis is increasing among the natives of India. We hope the authorities directing the work of missionary societies in India will give special heed to the chapter on "Tuberculosis and the Indian Christian Community." Dr. Lankester's sections on Immunity and Susceptibility raise points of far-reaching practical importance. The chapter on "Bovine Tuberculosis in India" is of exceptional interest to students of tuberculosis. We venture on several quotations: "All the evidence from India seems to prove that in this country surgical tuberculosis, which is in many areas excessively prevalent, is entirely independent of infection from bovine sources. . . . Bovine tuberculosis is practically an unknown disease throughout the whole of Southern India. . . . There seems to be ample evidence to justify the deliberate opinion that in India bovine

¹ "Tuberculosis in India: Its Prevalence, Causation, and Prevention." By Arthur Lankester, M.D., formerly Medical Missionary of the Church Missionary Society; Officer for Tuberculosis, Government of India; and Director, Medical and Sanitation Department, Dominions of H.E.H. The Nizam of Hyderabad. Pp. xv+317. Calcutta: Butterworth and Co. (India), Ltd., 6, Hastings Street. London: Butterworth and Co., Bell Yard, Temple Bar, E.C. 1920. Price 10s. net.

tuberculosis does not at present call for serious consideration as an important cause of the human disease, and that measures taken with a view to the improvement of the milk-supply should be directed towards the prevention of contamination after it has been drawn, rather than towards the elimination of tuberculosis from the cow." In the chapter on "Surgical Tuberculosis in India" the author dogmatically declares that "in India the element of bovine infection may probably be eliminated as an active agent in the production of surgical tuberculosis in children. In India, as in England, the infection in such cases is probably alimentary, but *here the medium of infection is not milk.*" In the study of the etiology of tuberculosis in India much attention is devoted to a consideration of community conditions, domestic arrangements, social customs, and personal habits, and special chapters are devoted to poverty and overcrowding; social customs regarding women, particularly as regards their seclusive child marriage and the non-hygienic management of child-birth; habits tending to the spread of consumption, including intemperance in the use of alcohol, drugs, and sexual excess; and unwise fashions in clothing. Dr. Lankester views his problem with a wide-angled lens, and discusses all the medico-sociological aspects with real vision and scientific wisdom. The problem is presented in all its perplexities, comprehensiveness, and endless difficulties, and is revealed as a question not only enveloped in darkness as far as the medical aspects are concerned, but closely related to almost all the economic, social, domestic, and personal elements in human life. It is true that Dr. Lankester proclaims a gospel of hope and a policy of scientific service in his concluding chapters, and certainly, if his advice can only be followed, there will be a possibility of great gain. The chapters dealing with prophylaxis and therapeutic measures should be considerably extended in the next edition. A map of India should be added, so that districts and places referred to in the text can be located by the English reader. Dr. Lankester has accomplished a notable service by the preparation and issue of his able monograph. It is an epoch-making work, and should initiate a comprehensive, scientifically directed, sympathetic, wise, educational, anti-tuberculosis movement throughout India.

MANUALS FOR MEDICAL ADVISERS AND WORKS OF REFERENCE.

Dr. W. Robertson and Dr. Charles Porter are the joint authors of a well-known handbook on "Sanitary Law and Practice," which has for long been recognized as an authoritative reference work.¹ A fifth and revised edition has recently appeared. The last issue was in 1917. The chief additions relate to housing, and are of special interest to all interested in the prevention and arrest of tuberculosis. The volume has been specially prepared for students undertaking systematic training

¹ "Sanitary Law and Practice: A Handbook for Students of Public Health and Others." By W. Robertson, M.D., D.P.H., M.R.C.P.E., Deputy Medical Officer of Health, Edinburgh, and Charles Porter, M.D., B.Sc., M.R.C.P.E., of the Middle Temple, Barrister-at-Law, Lecturer in Public Health, Middlesex Hospital Medical School, and Medical Officer of Health, Metropolitan Borough of St. Marylebone. Fifth Edition, revised, with numerous illustrations. Pp. xx + 757. London: The Sanitary Publishing Co., Ltd., 8, Bream's Buildings, Chancery Lane, E.C. 4. 1921. Price 18s. 6d. net.

preparatory to presenting themselves for the Diploma in Public Health; and for medical and legal advisers acting in connection with central or local Public Health authorities the work is indispensable. All medico-legal questions relating to the service of Public Health receive full consideration. A special section is devoted to the prevention of tuberculosis, and here are reproduced all essential regulations. The directions regarding the duties of the health official in dealing with tuberculous cases are explicit. Every tuberculosis officer will do well to study them with care.

The busy medical practitioner has now of necessity oftentimes to seek the services of a skilled pathologist who can command the resources of a modern laboratory. In this co-operation time, trouble, and expense can oftentimes be saved if there is a proper linking-up of the clinical and pathological workers. A very helpful handbook of practical suggestions and detailed instructions regarding the carrying out of the relations between the practitioner and the pathological laboratory has recently been issued by Drs. C. Fletcher and H. McLean, and should certainly be in the hands of all doctors who desire to be up-to-date in their methods of diagnosis and treatment.¹ An alphabetical list is given of diseases in which the pathologist can aid the practitioner, and ways and means are succinctly explained. There are special sections on blood preparations, specimens for spirochæte examinations, the investigation of urine, sputum, and other pathological products, throat swabs, drinking-water, milk, etc.; also notes on the sending of specimens and apparatus. The manual is a thoroughly practical guide and serviceable index for ready and rapid reference.

At this time of the year many health-seekers are considering the desirability of spending the winter months at one or more of the Mediterranean health stations. Those desirous of visiting Algiers would do well to secure a copy of Dr. Alfred S. Gubb's attractive, informing, and effectively illustrated little volume of notes on Algiers as a winter resort.² The handbook has been prepared mainly as a guide for the use of medical advisers. It is full of practical points and reliable data, and will be invaluable to all who are seeking health and happiness in this highly favoured district of North Africa. There is a helpful section on the therapeutic aspect of the climate of Algiers. Dr. Gubb places foremost among affections likely to be benefited chronic diseases of the respiratory tract, such as chronic bronchitis with emphysema, bronchiectasis, bronchial catarrh, and asthma.

¹ "The Link between the Practitioner and the Laboratory: A Guide to the Practitioner in his Relations with the Pathological Laboratory." By Cavendish Fletcher, M.B., B.S., M.R.C.S., L.R.C.P., and Hugh McLean, B.A., B.C., D.P.H., M.R.C.S., L.R.C.P. Pp. 91. London: H. K. Lewis and Co., Ltd., 28, Gower Place, W.C. 1. 1920. Price 4s. 6d. net.

² "From Cloud to Sunshine: Notes on Algiers and Algeria as a Winter Resort." By Alfred S. Gubb, M.D. Tenth Edition. Pp. 109, with Map. Alger: Imprimerie Algérienne, 2, Rue Bourlon. Price 3s. 6d.

PREPARATIONS AND APPLIANCES.

TUBERCLE VACCINE "R."

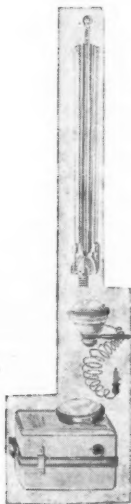
TUBERCULINS come and tuberculins go, and we still await the coming of the ideal tuberculin or vaccine or other agent which shall provide us with a reliable weapon in the conflict with the tubercle bacillus. Dr. Nathan Raw, in the application of his views regarding the action of the human and bovine forms of the tubercle bacillus, has been led to introduce TUBERCLE VACCINE "R." It is prepared from bacilli which have become non-pathogenic through being subcultured without a break for fourteen years. It is contended that natural attenuation, while removing the virulence and toxicity of the bacilli, has enhanced the value of the vaccine, and that the production of antibodies will take place without any preliminary shock to the system, such as invariably follows the injection of a vaccine prepared from a virulent strain of bacteria. Dr. Raw holds that his results obtained with the new vaccine in local and general tuberculosis are such as to warrant a thorough trial, and he claims that it possesses a remarkable power in controlling and preventing the spread of tuberculous infection in the human body. The vaccine as supplied is prepared from two strains of bacilli—human and bovine. Dr. Raw bases his treatment on the following points: (1) The human body is attacked by two distinct types of bacilli—namely, human and bovine; (2) these two types cannot grow in the body at the same time; (3) their method of infection is different and selective; and (4) human and bovine bacilli are antagonistic to each other, and a mild infection of the one type in the human body will produce an immunity to the other. Dr. Raw believes also that the organisms, human and bovine, are not transmutable, and cannot by any artificial growth be changed from one to the other type. These points, of course, are not universally accepted. Dr. Raw's method is based on the view that the two types of tubercle bacilli are antagonistic, and that a mild infection of the one protects against the other. He therefore holds that infections due to the human type are best treated with the vaccine prepared from the bovine strain, and infections due to bovine tubercle bacilli with the human strain. The doses used are much larger than have been possible hitherto, and it is recommended that the treatment should consist of at least twelve injections given in increasing doses at intervals of seven days. The strengths suggested for each course are: '001, '002, '003, '004, '005, '006, '007, '008, '009, '01, '0125, '025 mgrm. The vaccine can now be obtained in boxes containing twelve doses, which should be used within three months from the date of issue.¹ Dr. Raw also advocates the use of a prophylactic course. In patients with family history of tuberculosis and in those whose symptoms suggest a tendency to tuberculous trouble it is recommended that the immunity of the tissues

¹ Tubercle Vaccine "R" is now supplied by Allen and Hanburys, Ltd., 37, Lombard Street, London, E.C. 3, and 7, Vere Street, London, W. 1. Price of vaccine, 5s. per dose.

should be increased by a prophylactic course of six doses given at intervals of seven days. The doses recommended for prophylaxis are: '001, '002, '003, '004, '005, '006 mgrm. It is stated that to obtain the best results fresh vaccine must be used.

THE ELECTRO-AUTOMATE.

The new Automatic Electric Lamp now introduced under the title of "Electro-Automate" promises to be of exceptional service in medical practice, and particularly in the work of sanatoria and open-air schools and like institutions. In our last issue we gave an illustrated



notice of the Automatic Electric Lamp, and also one of the new Electric Laryngoscope. We now draw attention to a further development in connection with this valuable novelty. There is now available an "ELECTRO-AUTOMATE" TRIPOD STAND LAMP. The chief features will be made manifest by the accompanying figure. It will be noted that the lamp can be operated by the foot, thus allowing for freedom of both hands, a very important advantage in connection with medical measures. From the lamp there is an extension to the operator's button-hole, as shown in the illustration, so that as required current can be provided for the supply of a lamp in connection with laryngoscopic work or other procedures.¹

¹ Full particulars regarding all forms of the "Electro-Automate" can be obtained on application to Theo and Co., 6, Hatton Garden, 15, Johnson Street, Liverpool.

FLANNEL CLOTHING.

A new flannel fabric has recently been introduced under the name of Dols' Volatilise Flannel, and it is claimed for it that it is of special value for tuberculous and tuberculously disposed subjects in sanatoria, open-air schools, and generally for those who live an open-air life.¹ It is composed of pure wool which has been medicated, and it is stated that "the medicament is in intimate colloidal combination with the wool." The manufacturers claim that the flannel possesses "high radio-activity," lessens the discomforts which are often experienced by patients undergoing open-air treatment, dissipates the pains—commonly spoken of as neurotic and rheumatic—which are often met with in tuberculous subjects, especially during autumn and winter months, and generally adds to the well-being of delicate and invalid cases. We understand that the flannel is being tested in various sanatoria. The material is said also to be of service in dealing with lumbago, sciatica, and forms of fibrositis, and is likely to be useful in cases of chronic bronchitis and allied affections. The flannel is of dark brown colour, has a pleasant odour, can be worn day and night, does not irritate, but should not be exposed to bright sunlight. It can be supplied in various forms of underclothing, or as bandages, joint pads, etc.

SANITARY NOVELTIES FOR THE SANATORIUM, HOSPITAL, OR HOME.

The SORBO RUBBER SPONGE provides an ideal substitute for the natural sponge procured by native divers. It contains 90 per cent. of pure rubber, but is free from the objectionable features present in many rubber sponges. The Sorbo Sponge has no objectionable odour, contains no grit, is soft and silky in texture, does not become sticky or slimy in use, is very absorbent, can be readily cleansed and disinfected, may be used with either hot or cold water and with any kind of soap, is durable and inexpensive, and altogether may be counted an indispensable companion for the bath. Every sanatorium patient should possess a Sorbo.²

During recent years compressed fibre has become popular, not only for the construction of travelling boxes and cases, but in the production of many articles used in the equipment of offices, consulting-rooms, and apartments connected with hospitals, nursing-homes, and other institutions. The new material possesses great strength with lightness, and is not only inexpensive, portable, and durable, but can be employed in the construction of almost any class of article needed in the conduct of office work or for personal use in connection with travel and the protection and arrangement of goods. For use in grouping charts, clinical

¹ The Dols' Volatilise Flannel is manufactured by Dols, Ltd., Huddersfield, Yorks, from whom full particulars can be obtained on application. It is supplied at 7s. per yard.

² The Sorbo Rubber Sponges are manufactured in Britain and supplied by the Sorbo Rubber-Sponge Products, Ltd., the offices of which are at 24, Walbrook, E.C. 4. The prices range from 1s. 3d. to 1cs. 6d., and the sponges can be obtained from most chemists and from all the stores.

records, letters, notes, and the like, the new "Neverdone" FIBRE TRAYS and Medical Case Paper Boxes will be found of considerable service.¹

The HYGIENIC ALL-METAL ENVELOPE DAMPER is a simple little contrivance which should find favour especially in hospitals, sanatoria,



open-air schools, educational establishments, and all offices. It enables the old-fashioned and non-hygienic practice of licking envelopes and providing saliva for the use of adhesives to be discarded, and may therefore rank as an agent in the advancement of antituberculosis measures. The general appearance of this novelty is indicated in the accompanying figure. Water is placed within the receptacle, and this percolates through small

apertures at one end when in contact with the surface to be damped. The other end is employed to apply pressure for sealing.²

HYGIENIC APPLIANCES AND THERAPEUTIC PREPARATIONS.

SPUTUM PAPERS, or readily destructible, inexpensive crêpe paper handkerchiefs, are to be reckoned among the indispensable sanitary equipments of hospitals and sanatoria dealing with consumptives. The Dennison Manufacturing Company are now supplying excellent sputum papers for the use of tuberculous patients. These papers are of convenient size, and, while of soft and silky consistence, possess considerable strength and are not readily torn. The same firm are now supplying admirable CRÊPE PAPER BANDAGES, each 45 feet long and varying in width. These will be found effective and inexpensive for use in connection with surgical dressings.³

HARPIC is a new sanitary preparation which promises to be of service, not only in the ordinary home, but also in hospitals, sanatoria, schools, and other institutions. It is a special chemical cleansing agent, which, when used in lavatories, urinals, w.c. pedestals, washing bowls, sinks, and other vitrified ware, greatly facilitates work in maintaining the sanitary necessities in a hygienic condition.⁴

BRONAMALT is a preparation which proves of real value to many tuberculous and tuberculously disposed subjects in this country, especially during the months of winter. It is a Concentrated Liquid Extract of Malt of maximum diastasic efficiency, together with the tonic and aromatic constituents of cinchona. The cinchona alkaloids are present in the form of hydrobromates, and the preparation does not give rise to any symptoms of cinchonism. Bronamalt is particularly serviceable in dealing with tuberculous children; but it is an

¹ Full particulars regarding the "Neverdone" Fibre Cases and Boxes can be obtained on application to Mr. W. A. Bailey, The Excelsior Fibre Co., Ltd., 92, Canonbury Road, N. 1.

² The Hygienic All-Metal Envelope Damper is supplied by the Blick Copier Manufacturing Co., Ltd., Alliance Chambers, 1, Southwark Street, London Bridge, S.E. 1. Price 2s. each.

³ Full particulars regarding the Sputum Papers and Crêpe Paper Bandages can be obtained on application to the Dennison Manufacturing Co., Ltd., 52, Kingsway, W.C. 2.

⁴ Full particulars regarding Harpic can be obtained from the Harpic Manufacturing Co., 46-48, Goswell Road, E.C. 1.

excellent tonic in most forms of wasting disease, and is always helpful in convalescence from almost every form of severe illness.¹

Under the designation of "SPRAZONE"² there has been introduced a preparation to serve as an atmospheric disinfectant and air-cleanser. The purifier is distributed by means of a special spray. It is claimed that by means of the "Sprazone" outfit infectious and air-borne diseases can be prevented. Where there is risk of dust being the carrier of tuberculosis, it would seem probable that this new spray preparation may be of real service. In schools, hospitals, public halls, and other places where large numbers of people are brought together, and where the atmosphere becomes contaminated with various pathogenic organisms, the use of the "Sprazone" outfit is likely to be advantageous.

The firm of Certo, Limited, is providing certain sanitary novelties which will be appreciated in hospitals and sanatoria as well as in private houses. The "Certo"³ Patent FIRELIGHTERS supply simple, clean, expeditious, inexpensive means for facilitating the starting of a fire in the home or in an institution. They certainly are agents which save time, trouble, temper, and money. "NU-SOLE" will be appreciated by those who live the open-air life. It is a preparation for boots and shoes which preserves the leather and renders it in great measure waterproof. "TOZOL" is a general cleanser for paint, enamel, varnish, marble, and kitchen materials. It is also of service in the cleansing of motors and in general domestic service.

"Eno's Fruit Salt" has enjoyed half a century of popularity as a pleasant, reliable, and economic effervescent alkaline saline laxative. It is a preparation which is excellent for many tuberculous cases, and will be found very effective in dealing with certain forms of constipation met with in cases undergoing sanatorium treatment.⁴

During winter months much joy and encouragement may be brought to patients in hospital and sanatoria and to children in open-air schools by watching the development of flowering bulbs indoors and in the open. And now is the time to make provision. The well-known firm of A. C. Van Der Schoot, of Hillegom in Holland, have favoured us with specimens of their specialities. These Dutch-grown bulbs are now being supplied to British clients in select collections suitable for cultivation in the home or under glass or in the open. A great variety of hyacinths can now be obtained. Single and double tulips make a splendid show in the grounds of a sanatorium. Daffodils should also be found in the gardens and grounds of open-air schools. Children take special delight in watching the evolution of all kinds of flowering bulbs. We advise our readers to make early application for one of the illustrated price-lists of the fine products of the long-established Bulb Farm at Hillegom, now conducted by A. C. Van Der Schoot.⁵

¹ Specimens and particulars of "Bronamalt" will be sent to any doctor on application being made to the manufacturers, Fletcher, Fletcher and Co., Ltd., Vibrona Laboratories, Thane Road, Holloway, N. 7.

² Full particulars regarding the "Sprazone" outfit can be obtained on application to the United Laboratories and Chemical Company, Ltd., 97, Queen Victoria Street, E.C. 4.

³ Full particulars regarding the "Certo" specialities can be obtained on application to Certo, Limited, 42, High Street, Hampton Wick, Middlesex.

⁴ A sample bottle will be sent free of charge to any medical practitioner on application to J. C. Eno, Ltd., Blackfriars House, New Bridge Street, London, E.C. 4.

⁵ An illustrated Catalogue of Dutch Bulbs will be sent on application being made to the firm of A. C. Van Der Schoot, Etablissement Horticole, Hillegom, Holland.

THE OUTLOOK.

AN INTERNATIONAL POST-GRADUATE COURSE IN HELIO THERAPY.

LEYSIN — ROLLIER — HELIO THERAPY: These are names known to British and other medical advisers in all parts of the world, but the principles and methods of heliotherapy, which have been defined and elaborated by Dr. Rollier at Leysin, are still imperfectly realized and practised outside Switzerland.¹ The remarkable work which is being carried on should soon be better understood. From August 16 to 20 an International Post-Graduate Course in Heliotherapy was held at Leysin, and attended by medicals representing North and South America, Belgium, Britain, Czecho-Slovakia, Denmark, France, Holland, Italy, Norway, Poland, Portugal, Roumania, Russia, Serbia, Spain, Sweden, and Switzerland. Through the kindness of Dr. Rollier, the Editor of this Journal attended the course. The course was conducted by Dr. Rollier and his colleagues and assistants, including Dr. H. J. Schmid, the chief radiologist; Dr. Amstad, the first surgeon; Dr. Rosselet, the physicist; and Dr. Leuba, the dermatologist; and consisted of lectures, demonstrations of cases, appliances, practical methods, and radiographs, and visits to many of the thirty-nine Rollier group of cliniques. Dr. Rollier himself lectured every morning of the four days during which this intensive course lasted, dealing chiefly with the fundamental principles of heliotherapy methods in dealing with tuberculosis and other lesions in various parts of the body by "sun treatment," and the results of such management. A special feature of the course was the actual study of cases undergoing treatment in the various Leysin cliniques.² A visit was also made to Dr. Rollier's famous "L'Ecole au Soleil." It should be noted that the course was open to medicals without any fee. A second and Winter Course will be held January 12 to 14, 1922. As it will probably be necessary to restrict the numbers attending, all wishful to visit Leysin in January next should communicate at an early date with Dr. Rollier at Les Frênes, Leysin-Village, Switzerland. The course is open to all medicals without fee.

¹ Among recent publications in English dealing with the work at Leysin reference should be made to the following: "The Sun Treatment of Surgical Tuberculosis," *British Journal of Tuberculosis*, vol. xv., No. 1, January, 1921, pp. 10-13. "Heliotherapy in the High Alps," *The Lancet*, March 19, 1921, pp. 582-585. "The Construction of an Institution for the Heliotherapeutic Treatment of Surgical Tuberculosis," *Tubercle*, March, 1921, pp. 241-250.

² Medical advisers desirous of detailed information regarding the practical applications of heliotherapy will do well to consult the following publications: Cazin, M.: "La Cure Solaire des Blessures de Guerre." Paris: A. Maloine et Fils. "De la Cure Solaire dans le Traitement des Tuberculoses Externes." Paris: A. Maloine et Fils. Franzoni, A.: "Über den Einfluss der Sonnenstrahlen auf Tuberkulöse Sequester." Leipzig: Verlag von F. C. W. Vogel. Leuba, W.: "Die Heliotherapie der Fustuberkulose." Leipzig: Verlag von F. C. W. Vogel. Rollier: "L'Ecole au Soleil." Paris: Baillière et Fils. Straube, E.: "Über die Behandlung der Spondylitis tuberculosa in Leysin und die damit erzielten Resultate." Leipzig: Verlag von F. C. W. Vogel. Vodoz, P. L.: "L'Heliotherapie de la Coxalgie et ses resultats." Lausanne: Imprimerie du Leman. Widmer, J.: "Über den Einfluss der Sonnenbestrahlung bei der Hochgebirgsbehandlung der Chirurgischen Tuberkulosen." Leipzig: Verlag von F. C. W. Vogel. As the authoritative work, of course, Rollier's own book should be consulted: "La Cure de Soleil." Lausanne: Payot et Cie; Paris: Baillière et Fils.

THE INTERNATIONAL TUBERCULOSIS CONFERENCE.

At the International Tuberculosis Conference, Sir George Newman, Chief Medical Officer of the Ministry of Health, delivered an address on "State Action in the Prevention of Tuberculosis," in which, after indicating the necessity for State intervention and the form it should take, he claimed that, "since 1850: (a) There has been considerable progress in sanitary reform and great improvement in social well-being and nutrition. (b) There has been a steady increase in our knowledge of the etiology, pathology, and modes of transmission of the disease, as well as of its earlier clinical manifestations. (c) There has been an advance in the application of that knowledge to the prevention, early diagnosis, and treatment of the disease. (d) There appears to have been an increasing degree of immunity, due in part to the increased resistance of the population, and in part to those processes of natural protection of which we know so little." The present outlook in all its bearings was defined, and finally a "complete national scheme" was outlined: "(1) We must begin with *Notification* of the disease. No scheme can be organized without a knowledge of the extent and nature of the problem. One of the most serious handicaps under which we are labouring is the failure of a number of practitioners to notify their cases when first diagnosed. . . . Some steps will have to be considered for ensuring compliance with this compulsory regulation unless great improvement is effected. It now frequently happens that cases are not notified till a very short time before their death. There can, in the majority of cases, be no excuse for such a state of affairs. If the practitioner is unable to arrive at a diagnosis of a doubtful case himself, he has not only the opportunity, but it is his duty, to call to his assistance the local tuberculosis officer, and avail himself of the clinical and bacteriological facilities now at the latter's disposal. (2) The *Dispensary*, under the guidance of the tuberculosis officer, should be the consultation centre for the neighbourhood, and one of its chief functions should be to afford persons of all classes clinical and laboratory facilities for arriving at an early diagnosis of their condition. In view of the great difference between the curability of the disease in its early and later stages, the tuberculosis officer should make every effort to carry out an active search for such early cases, and not, as was too often done in the pre-dispensary days, leave the patient himself to detect the first suspicious symptoms of disease, and thus seek advice only when too late. Here we have the great reason for the systematic examination of all 'contacts,' a measure which should be carried out by tuberculosis officers more fully than has perhaps been the case hitherto, and I commend to my colleagues, the tuberculosis officers, a study of the new book by Professor Calmette, and especially its last chapter. Another great function of the tuberculosis dispensary is the supervision and improvement of home conditions. The value of home visiting by nurse and doctor will hardly be denied if only for their own enlightenment, and yet there is observable a tendency on the part of some tuberculosis officers to abandon this aspect of their work. From an administrative point of view, perhaps the most important function of the dispensary is to serve as a clearing-house for all the cases which come under the purview of the tuberculosis officer. After thorough examination at

the dispensary the patients should be grouped into various categories according to the type of institutional or other treatment most appropriate to each. The dispensary should also be a centre for treatment (a) in so far as the appropriate treatment for each case is prescribed there, (b) in so far as any particular form of treatment cannot 'consistently with the best interests of the patient be properly undertaken by a general practitioner of ordinary professional competence and skill,' and (c) in so far as the patient is uninsured, and after inquiry is found to be not in a position to obtain adequate treatment from a private practitioner. It will be obvious that under these conditions, and in view of the present lack of general confidence in any specific form of treatment suitable for administration at dispensaries to patients living in their own homes, the proportion of patients for whom dispensary treatment can properly be ordered is a small one. (3) Included in a complete scheme will be *Residential Institutions* (sanatoria, hospitals, etc.) for the various categories into which the patients may be divided. For the young there should be open-air sanatorium schools, both for 'the pre-tuberculous' and for those with definite lesions; there should be hospitals and convalescent homes for those with non-pulmonary and surgical tuberculosis. For the adults there should be sanatoria for the treatment of early cases and hospitals or homes for the isolation of advanced cases, or there may be combined institutions for the treatment of patients in all stages of the disease. At the sanatoria there should be special *Training Sections* where patients with more or less arrested disease may be 'hardened up' prior to their return to industrial life, and at the same time learn the rudiments of some useful trade or occupation which helps to interest and occupy their minds, even if it be too elementary a knowledge to enable them to earn a living by it on discharge. A complete scheme may in the future include industrial colonies and village settlements, though their extension may lie beyond State financial resources of the present time. Some extremely valuable pioneer work has already been done in this country on these lines at Polton and Hairmyres (under Dr. Macpherson), at Papworth (under Dr. Varrier-Jones), and at Preston Hall. It would be difficult to over-estimate the far-reaching effect of these important national experiments in treatment, training, and continuous after-care, or to exaggerate the new spirit of hope and promise which they inspire—an effect and a spirit which differentiate them from previous work. The future alone will decide whether such ideas are capable of practical development on a sufficiently economic basis to justify their establishment on a larger scale in conjunction with the other factors of a complete scheme. (4) Another feature of a complete scheme must be *After-care Work*, under which is included not only the supervision, care, and, if necessary, financial assistance of a patient on discharge from sanatorium, but a thorough study and a conscientious effort to put him in the best possible environment both at home and at work during the whole of his lifetime." After this lucid exposition of policy Sir George Newman added: "By way of summary, it may be said that we have in England and Wales 341 tuberculosis officers, 412 tuberculosis dispensaries, and 18,000 beds for tuberculous patients in sanatoria and hospitals, with 3,500 more beds in preparation. The number of cases notified was 73,332 in 1920, and there were 42,545 deaths from this disease. Most authorities agree that the success of this complete scheme

depends upon four conditions: (a) Early diagnosis and notification, and the selection of right type of case for respective form of treatment. (b) A sufficiently long period of residence for sanatorium cases in a properly managed sanatorium. (c) Thorough after-care work (including occupational therapy). (d) The willingness of the patient to begin treatment early, submit to its discipline, and persist in it continuously. The sanatorium *principle* expresses the bed-rock scientific truth of the matter at the present stage of our knowledge, but the sanatorium *system* has often been so misapplied that it has failed, and thus been discredited. What we now require, in all countries, is the sound practice expressing the true principle." We are glad to see that reference was made to the need for scientific investigation. "A complete Government scheme should include provision for *research work*, for upon this depends our future progress. In Great Britain much valuable work has been done under the auspices of the Medical Research Council since 1914, despite the fact that such work has been greatly hindered by war conditions." The concluding paragraphs of this illuminating address deserve special attention. "Finally, a word must be said as to the position of *the medical officer of health* or chief administrative head in a complete scheme. It is necessary that the various public health services should be administered by, and as, one department. Otherwise there will be confusion. This does not imply that the medical officer of health should do more than supervise and be generally responsible for the administrative measures put in force. He receives all notifications, and he should make these available for the tuberculosis officer. He must also be responsible for the collection of statistics and the compilation of annual returns. He is also responsible in large degree for the general measures to which I have referred, and for all the home visiting and sanitary conditions of his area. In practice it is often found convenient for the homes of tuberculous patients to be visited under the supervision of the tuberculosis officer, though any sanitary defects discovered are usually reported to the medical officer of health, and dealt with by him. There should be the most harmonious co-operation between the medical officer of health and the tuberculosis officer, and a close co-ordination of the institutions and methods they represent. Each can help the other in many ways, and both should work jointly with the medical practitioners of their district, for by so doing they will be advancing the common cause. 'Nothing in progress,' said Edmund Burke, 'can rest on its original plan,' and in looking to the future we must cultivate the open mind. There is no beaten track in the further conquest of tuberculosis. But we must endeavour to protect the healthy child and the adult from massive, frequent, or prolonged infection; we must fortify all the powers of resistance; and we must deal with the patient. Freedom of thought, wide and deep research, and mobility of action will be necessary. Of much are we still in doubt, but of three things we may be certain. Only by surveying the complex problem as a whole in the spirit of preventive medicine, and co-ordinating the respective factors of a complete scheme; only by thorough, constructive, and intensive practice of our principles; and only by searching and finding the hidden secrets of immunization, shall we at last conquer this disease."

TUBERCULOSIS AND EMIGRATION.

The Ministry of Health has recently issued Circular 231, in which it is stated that the Minister of Health has been in communication with the representatives in this country of the Government of the Commonwealth of Australia with reference to the conditions under which emigrants from the United Kingdom who have suffered from tuberculosis will be admitted into the Commonwealth. The Minister understands that, while the Commonwealth Government desire to exclude immigrants who are suffering from active tuberculosis, they are willing, subject to certain conditions, to admit persons in whom the disease has been arrested if they have received a period of treatment in a sanatorium, and have thus been educated as to the precautions necessary to preserve their own health and to protect that of others, and if there is an unequivocal history of freedom from symptoms of the disease during the immediately preceding twelve months. The conditions of admission include certification by a medical man who is an expert in tuberculosis, and it has been represented to the Minister that the work of the Commonwealth authorities would be greatly facilitated if the services of Tuberculosis Officers employed by local authorities could be made available for the examination and certification of persons in whom the presence of tuberculosis was suspected. The procedure which has been suggested for dealing with such cases is as follows: (1) The Medical References responsible for the examination of all intending immigrants to Australia will report to the Chief Medical Officer for the Commonwealth in London all cases in which traces of tuberculosis are discovered or suspected. (2) The Chief Medical Officer will refer every such case to the Medical Officer of Health for the County, County Borough, or Metropolitan Borough, in which the person resides, with a request that he will arrange for an examination to be made and a report furnished by the appropriate Tuberculosis Officer. (3) The Commonwealth Government will pay to the authority a fee of one guinea in respect of every examination made in accordance with these arrangements. An assurance has been given by the Commonwealth Government authorities that persons in respect of whom a satisfactory report is furnished by a Tuberculosis Officer will be admitted into Australia subject to the following conditions: (1) The formal consent of the Commonwealth Minister for Home and Territories must be obtained. (2) They will be subject to the ordinary examination by the Quarantine Medical Officer at the port of disembarkation, and in the event of their disease having become active during the voyage they would not be allowed to land. (3) They will be liable to report themselves for examination at the end of each twelve months during the first three years spent in Australia, and in the event of the disease having become active during that period they would be liable to deportation at their own expense.

The Minister of Health hopes that County and County Borough Councils will see their way to allow the co-operation of their Officers in the manner indicated.

NOTES AND RECORDS.

An International Conference on Tuberculosis, convened by the National Association for the Prevention of Tuberculosis, acting for the International Union Against Tuberculosis, was held in London, July 26 to 28, when delegates attended from all parts of the British Empire and most of the chief countries of the world. The proceedings have been well reported in the daily press and in the leading medical journals, and a volume of Transactions is in preparation.¹

Sir George Newman's last Annual Report as Chief Medical Officer of the Ministry of Health deals with the work of his department in 1920, and contains a general survey of the problem of tuberculosis.² The lines of action which have been taken are described in detail. With regard to institutional treatment, it is admitted that "the sanatorium, as it has often been worked, has not yielded its full value, and in some instances has, without doubt, in this and other countries, been a failure." The causes of this failure are enumerated, and the conclusion is arrived at that "it is not the sanatorium principle which has failed, but the application of its methods in respect of certain sanatoria, the relative failure of which has tended to bring the system itself into disrepute." The Report is revealing, and provides suggestions for investigation and abundant material for consideration and discussion. Here is Sir George Newman's conclusion; "There is no beaten track in the further conquest of tuberculosis. Only by co-ordinated action along various paths, and by all concerned, and only by surveying the complex problem as a whole in the spirit of preventive medicine, can tuberculosis be successfully overcome. We must protect the healthy child and adult from massive, frequent, or prolonged infection; we must increase all the powers of resistance; and we must treat the patient. Tradition and authority are good things, but experience is better. What we need is the large view and the long view. *We need a period of careful and constructive intensive work.* There has been a tendency, perhaps, to attempt to hasten progress and to secure quick results. But we need patience and research on all sides. There is good hope of victory, as the past decline of tuberculosis so abundantly suggests; but we must keep steadily on the attack at all points of the line, and with freedom and mobility—freedom of thought and mobility of action."

Volume III. of the Annual Report of the London County Council for 1920 contains much that will be of special interest and practical value to medical officers and others dealing with tuberculosis.³ There are suggestive sections relating to Aspects of the Epidemiology of Pulmonary Tuberculosis as exemplified by the Statistics of London Boroughs; the Influence of Migration and Industry; and Tuberculosis Mortality and Racial Susceptibility. Reference is also made to

¹ Applications for the Transactions of the International Conference on Tuberculosis should be addressed to the National Association for the Prevention of Tuberculosis, 20, Hanover Square, W. 1.

² "On the State of the Public Health: Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1920." Pp. 180. London: H.M. Stationery Office, Imperial House, Kingsway, W.C. 2. 1921. Price 1s. 6d. net.

³ London County Council: Annual Report of the Council, Vol. III. Public Health. Pp. 135+xxxix. London: P. S. King and Son, Ltd., 2 and 4, Great Smith Street, Victoria Street, Westminster, S.W. 1. 1921. Price 2s. 6d.

measures aiming at the treatment of tuberculosis. Information is also provided regarding provision for Open-air Education of Tuberculous and Tuberculously Disposed Children. In the Appendix appears a Special Report on Venereal Disease.

The monograph on "Tuberculous Salpingitis: A Clinical Study of Two Hundred Cases," by Dr. J. P. Greenberg, is a very important study of cases dealt with in the gynecological service of the Johns Hopkins Hospital. Tuberculous salpingitis was met with in nearly 1 per cent. of all the women admitted. Out of every thirteen abnormal tubes removed one was tuberculous. There is an excellent bibliography.¹

The Twenty-second General Meeting of the members of the National Association for the Prevention of Tuberculosis was held in the Institute of Civil Engineers, Westminster, on July 26. The Report of the Council provides an interesting review of tuberculosis work from 1898 to 1921.²

Photography not only provides a scientific and artistic pursuit for many patients in sanatoria or compelled to live an open-air life, but it is essential for the effective clinical study of all types of tuberculous disease. No hospital or sanatoria can be considered adequately equipped without a proper X-ray department. All interested in photography in its various branches should secure the new and eleventh edition of "The Wellington Photographic Handbook."³ It is an artistic album and practical manual providing full particulars regarding the "Wellington" plates, films, papers, etc., and the best way of employing them advantageously. The suggestions and directions supplied in this helpful volume will be invaluable to all classes of photographers. Those engaged in radiographic work should certainly secure a copy. The illustrations are perfectly charming.

The First International Post-Graduate Course in Heliotherapy at Leysin (as referred to on p. 187) having proved so successful, Dr. Rollier and his colleagues have consented to arrange for a mid-winter course. The second course will be held from January 10 to 14, 1922. The general programme will be similar to that of the first course. There is no fee, and medicals visiting Leysin will be provided for at the inclusive charge of 10 francs a day. It is certain that there will be a large attendance, and therefore British medicals should make early application for enrolment. The latest date for the receipt of names is December 15, 1921. All particulars may be obtained on application to Dr. Rollier's Medical Secretariat at Les Frères, Leysin-Village, Switzerland.

¹ Dr. J. P. Greenberg's monograph is issued as a reprint from "The Johns Hopkins Hospital Reports" (Vol. XXI., Fas. II.) by the Johns Hopkins Press, Baltimore, Maryland, U.S.A.

² A copy of "The Report of Council of the National Association for the Prevention of Tuberculosis" can be obtained on application to the Secretary at 20, Hanover Square, W. 1.

³ "The Wellington Photographic Handbook" is published by the well-known firm of Wellington and Ward, the works of which are at Elstree, Herts. The price is 1s. net, but we understand that medical advisers making application can receive a gratuitous copy.

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